Vol. 14 MARCH, 1925 No. 3

ENTRIES 2116–3139

M. J. Dorsey

BOTANICAL ABSTRACTS

PUBLISHED MONTHLY UNDER THE DIRECTION OF

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Published for the Owners,

THE BOARD OF CONTROL OF BOTANICAL ABSTRACTS, INC.,

by

THE WILLIAMS & WILKINS COMPANY

MT. ROYAL AND GUILFORD AVENUES

BALTIMORE, U. S. A.

Entered as second-class matter, November 9, 1918, at the post-office at Baltimore, Maryland, under the Act of March 3, 1879

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Vol. 14 MARCH, 1925 No. 3

ENTRIES 2116–3139

AGRONOMY (CROPS AND SOILS)

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(See also in this issue Entries 2269, 2273, 2303, 2311, 2312, 2313, 2354, 2382, 2389, 2394, 2447, 2522, 2523, 2532, 2549, 2558, 2559, 2561, 2562, 2565, 2579, 2583, 2587, 2588, 2618, 2621, 2629, 2637, 2639, 2826, 2954, 2979, 2984)

CROP SCIENCE (ARVICULTURE)

2116. ANONYMOUS. **An experimental cane sugar factory.** (West India Committee Circ.) Australian Sugar Jour. 16: 347, 348. 1924.—This paper gives a brief history and detailed description of the experimental cane sugar factory in course of erection for the Imperial College of Tropical Agriculture at St. Augustine, Trinidad.—*Nellie E. Fealy.*

2117. ANONYMOUS. **Ansichten uber die Funktion der Kohlensäure.** [**Opinions concerning the function of carbon dioxide.**] Wiener Landw. Zeitg. 72: 183–185. 1922.—A review of BORNEMANN'S theories on the fertilizer value of CO_2 [Kohlensäure und Pflanzenwachstum. P. Parey: Berlin, 1920.] and numerous criticisms thereof are given.—*F. Weiss.*

2118. ANONYMOUS. **Brisbane's first centenary.** Australian Sugar Jour. 16: 277, 279. 1924.—In the celebration of the discovery of the Brisbane River by Lieutenant Oxley, the centenary of which occurred last year, the sugar industry is to make a figurative display. Sugar was one of the crops grown in the early days of farming along the Brisbane River, but not until after the foundation of the colony did it become an industrial proposition. Sugar cane was introduced as early as 1847, and from canes experimentally grown in the Botanic Gardens sugar was made in 1862. In this centenary year the sugar crop amounts to some 370,000 tons, which not only supplies the requirements of the Commonwealth, but leaves some for export.—*Nellie E. Fealy.*

2119. ANONYMOUS. **Field experiments, 1923.** Jour. Dept. Agric. Ireland 23: 303–329. 1924.—Tests of various phosphatic manures on hay, pasture, turnips and potatoes, show that mineral phosphates compare favorably with other types as a dressing for grass land and for turnips.—Results of variety tests with barley, wheat, oats, mangels and potatoes are given.—Tests with oats, potatoes, turnips and mangels on peaty soils indicate that the standard

mixtures of manures developed by the Department for other soils are satisfactory.—Top-dressing autumn sown wheat in spring is profitable.—Spraying charlock in oat fields with $CuSO_4$ solution is profitable.—*Donald Folsom.*

2120. Anonymous. **Potato growing.** [Comment upon Seymour, Geo. **Potato growing in Australia.** *124 p.* Whitcombe & Tombs Ltd.: Melbourne, 1920(?)] Jour. Dept. Agric. Victoria **21**: 284. 1923.—Much information regarding methods and numerous statistics are given by a "recognized authority."—*Wm. E. Lawrence.*

2121. Anonymous. **Problems of crop production.** Nature **114**: 250. 1924.—This is a brief report of the presidential address of Sir John Russell to Section M (Agriculture) at the British Association meeting.—*O. A. Stevens.*

2122. Anonymous. **The history of Badila cane in Australia. The first seedling canes.** Australian Sugar Jour. **16**: 334–336. 1924.—In the early nineties cuttings of some 70 varieties of cane not grown in Australia were brought there from New Guinea and "sets" of each were "apparently" distributed to the different nurseries operated by the Queensland Department of Agriculture. The history of these introductions is given. "The erect habit, good tonnage, high quality and good ratooning qualities of Badila have proved a godsend to every one directly or indirectly connected with the sugar industry of Australia, and the discovery of that variety marks a red letter day. . . . At the same time it is doubtful whether any seedling cane produced in Australasia or elsewhere, that has come under the notice of experimenters, has shown the all-round excellent qualities of Badila for climates that are warm and moist, or where ample rainfall or irrigation in conjunction with warmth exists." Out of the above-mentioned experiments with New Guinea varieties sprang the development of seedling canes in Australia.—*Nellie E. Fealy.*

2123. Anonymous. **The vindication of Coimbatore.** Internat. Sugar Jour. **26**: 349–350. 1924.—The work of the Coimbatore Cane Breeding Station and that of C. E. Barber, which were unfavorably criticised by the Indian Sugar Commission appointed by the Indian Government in 1919 to investigate the condition of the Indian sugar industry, were vindicated by a report made in January, 1923, to the Board of Agriculture of India by a Committee which the Board appointed "with a view to giving effect to the resolutions of the Indian Sugar Commission," with special reference to Coimbatore. If funds are now made available by the Indian Treasury Barber's work will be placed on a permanent footing and Coimbatore will serve as a center of research for the whole of India. Since the report was issued remarkable accounts of the success of the Coimbatore seedlings have been made.—*Nellie E. Fealy.*

2124. Anonymous. **The Wembley exhibition. The colonial sugar display.** Internat. Sugar Jour. **26**: 353–354. 1924.—A detailed description is given of exhibits of sugar and its accessories made by the Dominions and Colonies of the British Empire, including Mauritius, Natal, British Guiana, Leeward Islands, Barbados, Jamaica, Trinidad and Australia.—*Nellie E. Fealy.*

2125. Agee, H. P. **Director's report.** Rept. Committee in Charge Exp. Sta., Hawaiian Sugar Planters' Assoc. **1921**: 7–45. 1921. (In Proc. 41st Ann. Meeting Hawaiian Sugar Planters' Assoc. **1921**: 223–261. [1922].—This is a general resume of the year's work on the following subjects: Insect and fungus enemies of sugar cane, improvement of sugar cane by bud selection, propagation of sugar cane seedlings, soil and fertilizer studies, forestry, pineapple investigations, chaulmoogra oil tree plantings, repression of lantana by insects, and insect collections.—*J. M. Westgate.*

2126. Agee, H. P. **Director's report.** Rept. Committee in Charge Exp. Sta. Hawaiian Sugar Planters' Assoc. **1922**: 6–71. 1921. (In: Proc. 42nd Ann. Meeting Hawaian Sugar Planters' Assoc. **1922**: 226–291. [1923].—The year's work on the following subjects is reviewed: Production studies, insect enemies and plant diseases, plant breeding, irrigation and fertilizer practices, soil survey work, effect of brackish water in irrigation, forestry problems, and pineapple investigations.—*J. M. Westgate.*

2127. Agee, H. P. **Director's report.** Rept. Committee in Charge Exp. Sta. Hawaiian Sugar Planters' Assoc. **1923**: 5–117 (In: Proc. 43rd Annual Meeting Hawaiian Proc. 43rd Annual Meeting Hawaiian Sugar Planters' Assoc. **1923**: 170–281. [1924]).—A review of the year's work on the following subjects is given: Insect and fungus enemies of sugar cane, soil

and fertilizer investigations, plant breeding work with cane varieties, forestry, and pineapple investigations.—*J. M. Westgate.*

2128. Alexander, W. B., C. E. Lane-Poole, and D. A. Herbert. **Lists of the principal indigenous West Australian plants of economic importance and of naturalized aliens and weeds established in the State with their vernacular names.**—Jour. and Proc. Roy. Soc. Western Australia **6:** 41–46. 1920.—These lists were prepared by a committee appointed by the Royal Society of Western Australia, which recognizes that there are many other plants of some local importance, which have not been included.—*Mary R. Burr.*

2129. Arny, A. C. **Winter hardiness of medium red clover strains.** Jour. Amer. Soc. Agron. **16:** 268–278. 1924.—Medium red clover seed produced in the northern tier of states, when grown in Minnesota gave a low percentage of winterkilling. Strains from France, Chili and Italy winterkilled 81%, 89.5% and 93.8% respectively and no measurable yield of hay was secured. Only native, northern grown seed should be sown in Minnesota.—*F. M. Schertz.*

2130. Arny, A. C., and F. W. McGinnis. **The relative value of the annual white, the biennial white and the biennial yellow sweet clovers.** Jour. Amer. Soc. Agron. **16:** 384–396. 1924.—The greater yield of hay or of pasturage by the annual white variety of sweet clover during the season sown, should establish its use where an annual hay crop is desired and the effect on the land is of secondary consideration.—*F. M. Schertz.*

2131. Ball, C. R., C. L. Shear, R. A. Oakley, Wm. Crocker, R. A. Harper, R. A. Gortner, H. H. Love and J. G. Lipman. **Symposium on research fundamental to the solving of crop-plant problems.** Jour. Amer. Soc. Agron. **16:** 553–632. 1924.—Introductory remarks and (1a) taxonomy are given by Carleton R. Ball; (1b) taxonomy and mycology, by C. L. Shear; (2) morphology, by R. A. Oakley; (3) plant physiology, by Wm. Crocker; (4) cytology, by R. A. Harper; (5) biochemistry, by R. A. Gortner; (6) genetics, by H. H. Love; and (7) edaphics, by J. G. Lipman.—*F. M. Schertz.*

2132. Bauer, F. C. **The educational service of outlying experiment fields in agronomy.** Jour. Amer. Soc. Agron. **16:** 325–331. 1924.—This is a paper read as a part of the symposium on "Extension work in agronomy" at the 1923 Meeting of the Society held in Chicago, Illinois, in which the author points out the educational values of the field or farm demonstrations. —*F. M. Schertz.*

2133. Beauverie, J. **Sur les circonstances qui peuvent modifier l'effet de la "periode critique" sur le rendement du blé.** [**The conditions which may modify the effect of the "critical period" on the yield of wheat.**] Compt. Rend. Acad. Sci. Paris **77:** 1060–1061. 1923.—According to the author, the idea of a critical period for the water requirements of the plant conditioning the yield is sound, but it should be complemented by a study of the modifications which the pre- and post-critical periods exercise upon its action toward the plant in certain particular cases.—Examples of such modification are given. [See also Bot. Absts. 12, Entry 5293.]—*Frederick V. Rand.*

2134. Böltz, W., G. Reisch, and H. Jantzon. **Einsäuerungsversuche aus dem Jahre 1922.** [**Ensiling studies of 1922.**] Mitteil Deutsch. Landw. Ges. **39:** 813–816. 1924.—Part of a mixture of mais and vetch as grown, is made into hay and part into ensilage in an American silo. Analyses of the product both as hay and as silage, together with feeding tests on a wether showed that the percentage of organic substance and of crude protein digested was about the same for both feeds but that a large proportion of protein had been lost in the ensilage, mostly through the escape of sap. The dung was found to contain a higher percentage of dry matter when ensilage was fed than when the hay was fed.—*A. J. Pieters.*

2135. Brown, B. E. **Nitrogen and potash fertilizer salts in relation to potato production.** Proc. 10th Ann. Meeting Potato Assoc. Amer. *P. 96–104.* 1923 [1924].—A study of the influence of different nitrogen and potash carriers on the growth and yield of the potato has been conducted on a fairly large scale by the Office of Soil Fertility Investigations of the U. S. Dept. Agric. since 1917. The author explains that while no attempt will be made to consider the 3rd element—phosphoric acid—its influence on the growth and yield of the potato is fully recognized. Air derived nitrogen salts compared very favorably with nitrate of soda and ammonium sulphate. Doubt is expressed as to the advisability of using ammonium chloride. Potash was found to be more essential on some soils than others. Muriate of potash gave the best results.—*W. Stuart.*

2136. Chung, H. L. **Report of the Agronomy Division.** Hawaii Agric. Exp. Sta. Rept. 1921: 26–35. *Pl. 2.* [1922].—Investigations concerning the following are discussed: cassava (variety test), edible canna (*Canna edulis*, best time of harvesting), sweet potatoes (variety test), corn (breeding), Uba cane (bloomed for 1st time since initial planting in 1915), cowpeas (variety test), kudzu (*Pueraria thunbergiana*, cutting versus seed propagation).—*J. M. Westgate.*

2137. Chung, H. L. **Report of the Agronomy Division.** Hawaii Agric. Exp. Sta. Rept. 1922: 8–12. *Pl. 1.* [1924].—General notes are given on cassava, mangel wurzels, corn, grasses (*Pennisetum purpureum, P. merkeri, Tricholaena rosea, Andropogon sericeus, A.* sp., *A. saccharoides, Panicum setosum, P. complanatum, Exophorus unisetus, Tripsacum laxum*), sorghum, kale, cowpeas, Hubam clover, and sunn hemp (*Crotalaria juncea*).—*J. M. Westgate.*

2138. Chung, H. L. **Reports of the Agronomy Division.** Hawaii Agric. Exp. Sta. Rept. 1923: 6–7. [1924].—Brief description is given of work with *Pennisetum purpureum* (Napier grass), *Tripsacum laxum* (Guatemala grass which bloomed and set seed for the 1st time since planting in 1919), Uba cane, sweet potatoes (variety test of Hawaiian versus mainland varieties), mangel wurzels (variety test), and sunn hemp (as a green manure crop).—*J. M. Westgate.*

2139. Chung, H. L., and J. C. Ripperton. **Edible canna in Hawaii.** Hawaiian Agric. Exp. Sta. Bull. 54. *1–16. 4 pl., 4 fig.* 1924.—Edible canna (*Canna edulis*) yields 18–20 tons of "tubers" (corms) per acre at 9 months from planting. Tubers of the same age or stage of growth showed about the same composition regardless of altitude or locality. Tubers which remained in the ground for 2 years showed a loss in protein but otherwise appeared unchanged. The feeding value of both the tubers and the tops compares favorably with that of other starch and forage crops. The fact that it can be harvested at any time during the year makes it well adapted either to keep a small labor force continually employed or to provide temporary work for a larger force when not otherwise engaged. The edible canna starch is characterized by very large grains. Its viscosity is greater than that of corn starch but less than that of potato starch. The starch appears potentially important both commercially and in the human dietary, the large granules rendering the product suitable for invalids and infants.—*J. M. Westgate.*

2140. Clark, C. F. **Breeding and selection.** Proc. 10th Ann. Meeting Potato Assoc. Amer. *P. 42–45.* 1923 [1924].—This paper discusses the season's activities from the breeding standpoint as carried on at the Minnesota, Ohio and New York Experiment Stations and the U. S. Dept. Agric. in cooperation with the New York Botanic Gardens. Foreign papers by Salaman and Lesley and Mabel S. G. Breeze are also reviewed.—*W. Stuart.*

2141. Clayton, E. S. **A potato trial at Albury.** Agric. Gaz. New South Wales 35: 748. 1924.—Brief notes are given upon ten varieties of potatoes grown upon 1 farm.—*L. R. Waldron.*

2142. Corey, D. W. **Corporate marketing.** Proc. 10th Ann. Meeting Potato Assoc. Amer. *P. 122–125.* 1923 [1924].—The author presents many reasons why the corporate marketing of potatoes can be more successfully accomplished than can individual or cooperative marketing.—*W. Stuart.*

2143. Cross, Wm. E. **El Rhodes grass en la Argentina. [Rhodes grass in Argentina.]** Rev. Indust. y Agric. Tucuman 13: 65–72. *1 fig.* 1923.—Rhodes grass, an introduced forage plant, has given excellent results in Tucuman, proving resistant to heat, drouth and freezing temperatures. Yields have been good. The plants crowd out weeds, but never become weedy in turn, being easily eliminated by 1–2 plowings. Tests indicated that 2–3 animals per hectare of land planted to this grass could be maintained throughout the year. Reports from a large number of plantations where the grass was tested indicated uniformly satisfactory results. —*John A. Stevenson.*

2144. Cross, Wm. E. **Experimentos con la remolacha azucarera en Tucuman. [Sugar beet experiments in Tucuman.]** Rev. Indust. y. Agric. Tucuman 13: 131–142. 1923.—Observations having indicated that sugar beet culture would be successful in Tucuman and thus provide for the operation of the sugar mills over a much longer period, definite experiments were undertaken. Plantings made from September to November were failures. April and May plantings of 4 varieties gave satisfactory yields with good sugar content. Plots treated with manure or lime gave greater yields than check plots, but with lower sucrose content.

Chemical tests indicated that the larger the root, the less the sucrose. Beets in storage lost moisture with a corresponding increase in sucrose. In spite of late planting, other American varieties tested in 1921–22 gave fairly satisfactory yields.—*John A. Stevenson.*

2145. Cross, Wm. E. **La caña del lote fundador de la estación experimental.** [The cane of the original plot of the experiment station.] Rev. Indust. y Agric. Tucuman 13: 211–214. 1923.—The original plantings of sugar cane varieties were made in 1910. Since that time many have been lost, but the Javan seedlings P.O.J. 36, 213, 228, 234 and Kavangire have persisted. Tables are presented showing the yields of these varieties as well as the results of chemical analysis. P.O.J. 36, 213, and Kavangire maintained high production over the entire period; the other varieties showed a gradual falling off.—*John A. Stevenson.*

2146. Cross, Wm. E. **La estacion experimental Agricola de Tucuman. Su contribucion a la industria azucarera de Puerto Rico.** [The Tucuman Agric. Exp. Sta. Its contribution to the sugar industry of Porto Rico.] Rev. Indust. y Agric. Tucuman 13: 207–211. 1923.—The Tucuman Exp. Sta. in 1915 sent to Porto Rico cuttings of a number of cane varieties including Kavangire and several Javan seedlings. Kavangire was used to control the epidemic of mosaic disease in 1917. The author reviews Porto Rican publications dealing with this variety.—*John A. Stevenson.*

2147. Cross, Wm. E. **La selección de la caña pora plantar.** [Selection of cane for planting.] Rev. Indust. y Agric. Tucuman 14: 61–66. *1 fig.* 1923.—In contrast to the great attention given to selection of seed or other planting material of many of the economic plants, comparatively little such work has been done with cane. Sugar-cane seed selection has been recommended by pathologists and entomologists for many years, but has been ignored in large part by the growers. In Java, however, it has been the practice forced by necessity to select planting material free of sereh and mosaic, which entails the growing of special seed plots or nurseries. In Hawaii during recent years work has been conducted along different lines, namely, selection of cane stools for vigor, upright habit, high yield and related points. The desirability of seed selection to improve cane culture in Tucuman is emphasized and the methods recommended for use by the planters are outlined.—*John A. Stevenson.*

2148. Cross, W. E. **Los ensayos con la remolacha azucarera.** [Sugar beet tests.] Rev. Indust. y Agric. Tucuman 14: 121–127. *2 fig.* 1924.—Experiments with sugar beets have been under way at the Tucuman Agric. Exp. Sta. since 1917, results through the season of 1922 having been published in the above named journal in 1923. For the season of 1923, 13 varieties were planted on the 28th of April. Uniform culture was given the plots. The usual chemical tests were made and the crop was harvested in January. Yields were satisfactory, varying with the variety from about 3000 to 3600 kilos per hectare. Plantings of several of these varieties made in May suffered more from drouth and the yields were reduced. Similar cultural tests were made at substations. Results to date indicate that sugar beet culture can be successfully carried on in Tucuman. Brief cultural directions adapted to Tucuman conditions are given.—*John A. Stevenson.*

2149. Cross, Wm. E. **Noticias sobre la grama Rhodes.** [Notes on Rhodes grass.] Rev. Indust. y Agric. Tucuman 14: 73–75. *2 fig.* 1923.—Rhodes grass which has been under trial in Tucuman since 1917 is proving very satisfactory from several points of view. It successfully keeps down weeds, particularly weed grasses such as Bermuda grass, and for this reason is being much planted in roadways between cane fields. Recently it has been found to give excellent results when planted with alfalfa.—*John A. Stevenson.*

2150. D., W. D. **The potato crop.** Jour. Dept. Agric. Ireland 23: 365–377. 1924.—The distinctness of variety between stocks with certain commercial names is given. Immunity to wart disease is noted. Small seed tubers are desirable if free from disease. The optimum distance between seed-pieces and between drills differed with the locality. Imported seed was not better than native-grown. Recommendations based on a variety test are given.—*Donald Folsom.*

2151. Dean, Daniel. **Individual marketing.** Proc. 10th Ann. Meeting Potato Assoc. Amer. *P. 117–122.* 1923 [1924].—This is a discussion of the advantages and disadvantages of individual marketing of a crop.—*W. Stuart.*

2152. Dean, Daniel. **Sub-surface application of potato fertilizers.** Proc. 10th Ann.

Meeting Potato Assoc. Amer. *P. 110–113.* 1923 [1924].—The author recommends fall plowing of land coupled with spring tillage to prevent weed growth and to conserve moisture. Fertilizers are applied to the surface of the fall-plowed soil some time in May by means of a broadcasting sower. The usual application is 1 ton per acre. A heavy disk harrow is used to mix the fertilizer with the soil. The author believes that this insures the development of a more extensive root system than if the fertilizer is applied in the drill row.—*W. Stuart.*

2153. Director of the Imperial Institute. **Coffee cultivation in Tanganyika.** Bull. Imp. Inst. [London] **21:** 468–470. 1923.—Over 2000 acres of coffee are grown in Tanganyika. Analysis of samples shows the product to be of good quality.—*L. A. Kenoyer.*

2154. Drew, J. P. **The growing of crops for silage and some experimental results.** Jour. Dept. Agric. Ireland **23:** 144–157. *Fig. 1–3.* 1923.—Silage from a mixture of beans, peas, vetches and oats, as a substitute for swedes and mangels, is discussed as to soil, place in rotation, seeding, manuring, cutting, filling the silo, and feeding. This system is thought to be profitable only for the large farm.—*Donald Folsom.*

2155. Dungan, George H. **Some factors affecting the water absorption and germination of seed corn.** Jour. Amer. Soc. Agron. **16:** 473–481. 1924.—Seed corn harvested before complete maturity absorbed water more rapidly and also possessed a greater water absorptive capacity than corn that had been allowed to mature on the stalk. Corn containing a high proportion of soft starch in the endosperm imbibed water at a more rapid rate than corn of the same variety which possessed an endosperm containing a less proportion of soft starch. Conversely, a high proportion of horny starch in corn reduced water absorption. Both high protein corn and nearly disease-free corn were relatively high in horny material and their rates of water absorption were comparatively low. Rapidity of water absorption was associated with quick germination. Seedling vigor more often accompanied horniness of the kernel. Mature seed corn germinated somewhat more slowly, but with more vigor than corn of the same variety harvested before maturity. Corn containing a large quantity of moisture during storage germinated more quickly, but with less vigor than corn containing a smaller quantity of stored moisture.—*F. M. Schertz.*

2156. Evans, Arthur T., and A. L. Bushey. **Some factors in storage.** Proc. 10th Ann. Meeting Potato Assoc. Amer. *P. 184–187.* 1923 [1924].—Four varieties of potatoes were used—Early Ohio, Irish Cobbler, Carman No. 3 and Rural (presumably Rural New Yorker No. 2)—for the purpose of determining if possible the cause of changes accounting for differences in the keeping quality and palatability of potatoes. Moisture, sugar, nitrogen and ash determinations were made from the beginning and later on the amount of CO_2 given off was considered. The authors' conclusions were that moisture was the oustanding factor in decay. Temperature was found to be a secondary consideration.—*W. Stuart.*

2157. Fawcett, G. L. **Algunas notas sobre el efecto del frio sobre las yemas de la caña. [Notes on the effect of cold on cane buds.]** Rev. Indust. y Agric. Tucuman **14:** 67–73. 1923.—A series of experiments under controlled conditions was carried out to test the effect of freezing temperatures on buds and shoots of sugar cane. Selected 1-eye cane cuttings were immersed in solutions varying from 0° to −3°C. for periods varying from 1 to 3 hours. It was found that a temperature of −3°C. destroys the buds; shoots are less resistant, temperatures of −1.5° to −2° sufficing to kill them.—*John A. Stevenson.*

2158. Gutbrod. **Ist wirklich Grünland überall Voraussetzung einer einträglichen Rinderzucht. [Is grassland always necessary for a profitable cattle industry?]** Mitteil. Deutsch. Landw. Ges. **39.** 774–779. 1924.—This is an address before the cattle breeding section of the German agricultural society in which the speaker, while admitting the desirability of meadows and pastures, points out that in Unterfranken in Bavaria the industry flourishes in spite of a lack of grassland. Cattle are mainly stall fed.—*A. J. Pieters.*

2159. Hardenburg, E. V. **Ecological factors affecting tuber-set in potatoes.** Proc. 10th Ann. Meeting Potato Assoc. Amer. *P. 165–172.* 1923 [1924].—The author briefly reviews the literature on the subject and then presents results of his own studies made for the purpose of measuring the influences of certain ecological factors on the set of tubers. These factors were air temperature, soil temperature, soil moisture, soil type and time of planting and harvesting. Wide variations in tuber set due to the influence of these several factors, were obtained.—*W. Stuart.*

2160. Hardenburg, E. V. (Chairman). **Report of committee on varietal nomenclature and testing.** Proc. 10th Ann. Meeting Potato Assoc. Amer. *P. 75–79.* 1923 [1924].—The author first defines the status of the variety group classification of the Association and then presents the year's accession of knowledge with regard to the identity of certain varieties.—*W. Stuart.*

2161. Hurley, J. M. **Marketing seed potatoes.** Proc. 10th Ann. Meeting Potato Assoc. Amer. *P. 126–127.* 1923 [1924].—The author presents the data secured from a request containing 8 direct questions concerning the raising and marketing of seed potatoes.—*W. Stuart.*

2162. Huston, H. A. **Potato fertilization.** Proc. 10th Ann. Meeting Potato Assoc. Amer. *P. 85–92.* 1923 [1924].—Commercial fertilizers, according to the author, should be regarded as supplements to, rather than substitutes for the manurial resources of the farm. To derive the most profit from commercial fertilizers consistent with maintaining or increasing the productiveness of the soil the plant food furnished must be of the right kind, amount and form, and must be applied at the proper time and in the right manner. Potato formulae are considered and some typical ones given.—*W. Stuart.*

2163. Hutcheson, T. B., and T. K. Wolfe. **The correlation between time of germination, maturity and yield of corn.** Jour. Amer. Soc. Agron. **16**: 483–485. 1924.—The coefficients of correlation between the time of germinating and tasseling are conflicting. The correlation between the time of germination and silking is too small to be significant and the same is true of the correlation with yield. Ears which germinate early produce plants which ripen late; plants which tassel and silk early mature late and give high yields.—*F. M. Schertz.*

2164. Jensen, Ove. F. **The fertilization of potatoes in the Middle Western States.** Proc. 10th Ann. Meeting Potato Assoc. Amer. *P. 104–110.* 1923. [1924].—High yields of potatoes are only possible when the plants are adequately supplied with available plant food and the soil is properly cultivated. The author discusses his subject under the following headings: Fertilizer practice as influenced by the type of farming; selecting the fertilizer for the soil, making the fertilizer application, method of planting, and the need for more information on potato fertilization.—*W. Stuart.*

2165. Johnson, W. H. **Cotton growing in Australia.** Bull. Imp. Inst. **21**: 596–607. 1923.—"The soil and climatic conditions in large portions of Queensland, Northern New South Wales, North-West Australia, the Irrigation Settlements, and probably also in the Northern Territory, are well adapted for cotton cultivation, but properly conducted experiments will have to be carried out to decide whether the crop can be profitably grown on a commercial scale, and to determine the best planting season and the variety or varieties that are best adapted for cultivation in particular districts. Careful seed selection of approved varieties will have to be practised, and the seed supply strictly controlled in order to prevent varietal mixture."—*Author's summary.*

2166. Johnston, C. O., and C. W. Bower. **A method of detecting mixtures in Kanred wheat seed.** Jour. Amer. Soc. Agron. **16**: 467–470. 1924.—The rust test applied to seedlings is a good index of the purity of Kanred seed wheat. The method may also be used for several of the durum wheats. *F. M. Schertz.*

2167. Jones, Jenkins W. **Observations on the time of blooming of rice flowers.** Jour. Amer. Soc. Agron. **16**: 665–670. 1924.—Three-fourths of the flowers bloomed between 12 noon and 2 p.m.; more of the flowers bloomed between 2 and 4 p.m. than between 10 a.m. and 12 noon. Data indicate that rice flowers bloom later in the day in California than they do in other localities.—*F. M. Schertz.*

2168. Kearney, Thomas H., and George J. Harrison. **Length of cotton fiber from bolls at different heights on the plant.** Jour. Agric. Res. **28**: 563–565. *Fig. 1.* 1924.—Working with the Pima variety of American Egyptian cotton, determinations were made of the length of fiber from bolls borne on fruiting branches at successive groups of nodes on the main stalk. The length of fiber was found to increase steadily from the lowest to the next to highest group of fruiting branches. On the other hand, no close correlation was found to exist between length of fiber in a boll and date of anthesis of the flower from which the boll had developed.—*T. H. Kearney.*

2169. Kemp, W. B. **The reliability of a difference between two averages.** Jour. Amer. Soc. Agron. **16**: 359–362. 1924.—The paper shows that "Students" method is more reliable than "Bessels" in interpreting the results of crop investigation.—*F. M. Schertz.*

2170. Kiesselbach, T. A. **Relation of seed size to the yield of small grain crops.** Jour. Amer. Soc. Agron. **16**: 670–682. 1924.—Small seed of winter wheat, spring wheat and oats yielded 18% less than large seed when spaced to permit maximum development of individual plants, 10% less when equal numbers of seed per acre were sown and 5% less when equal weights of seed per acre were sown at an optimum rate for the large seed. Unselected seed yielded 4% less than the large when equal numbers were sown per acre, and 1% less when equal weights of seed were sown. Results at the Nebraska station indicate that no material or practical gain is secured from the practice of trading small grain seed.—*F. M. Schertz.*

2171. Kläsener, Otto. **Wurzelentwicklung verschiedener Kartoffelsorten nach den Verhältnissen des Göttinger Versuchsfeldes.** [**Root development of different varieties of potatoes at Göttingen.**] Jour. Landw. **72**: 65–102. 1924.—The following potato varieties were grown: Ebstorfer up to date, Julikartoffel, Thieles weisse Riesen and Göttinger Industrie. The depth, total length of roots, weight of primary and secondary roots, spread of roots, weight of fresh, and of dry roots, weight of tops and tubers are tabulated. Pot and field experiments are reported.—*F. M. Schertz.*

2172. Kotowski, Feliks. **Czy należy stosować rachunek prawdopodobieństwa do doświadczeń Polowych?** [**The application of calculation of probability to field experiments.**] Roczników Nauk Rolniczych **9**: (1–15). 1923.—On the basis of a critical discussion of the study of Górski and Stefaniów on oats and of his own results on potatoes, the author advocates the following treatment of the value of the results in field trials: The average errors and not the probable errors are to be determined. The probable error may be calculated after having ascertained the Gaussian law in every case. If the number of control plots is larger than 10 it may be easily verified whether the deviations from the average (A) are in accordance with the theory of probability. If the number of control plots is small (4–10) the Gaussian law becomes the exception, consequently the estimation of results will be rational, when expressed in the formula: $A \pm \sigma$, or $A \pm \frac{\sigma}{\sqrt{n}}$.—*From author's abstract.*

2173. Kotowski, Feliks. **Spólczynnik jednolitości gleby i jego zastosowanie do doświadczeń polowych.** [**A criterion of field homogeneity and its value in field trials.**] Roczników Nauk Rolniczych **11**: (1–11). 1924.—The author has examined his own results on potatoes as well as those published by Górski and Stefaniów (Idem. vol. 8, 1917), on oats, by determining the coefficient of intra-plot-correlation according to the method of J. A. Harris. By applying this method the following results were obtained: (1) Regarding the discrimination of soil composition in experimental fields, the data were calculated as quantitative coefficients. This leads to an exact determination of a program for research.—(2) The experimental plots were established in the more homogeneous zones in order to obtain maximal results from the used area. (3) The criterion of field homogeneity is an independent problem and confirmation of the calculations is made by means of biometrical analysis, by application of the calculus of probability, and by check plot technique.—*Author.*

2174. Krause, F. G. **Pigeon-pea (Cajanus indicus) fertilizer experiment.** Hawaii Agric. Exp. Sta. Rept. **1922**: 21. *Pl. 1.* [1924].—An experiment conducted on sterile raw upland soil with 500 pounds of phosphatic fertilizer showed a yield of 13.07 tons of green forage per acre as against 2.61 tons for the unfertilized plot. On good soil in semi-arid sections irrigated plots averaged 82,900 pounds (entire plant including roots) per acre 7 months after planting as against 32,500 pounds for the non-irrigated plots.—*J. M. Westgate.*

2175. Krauss, F. G. **Suggested cropping systems for swine in Hawaii.** Hawaii Agric. Exp. Sta. Bull. 48. *31–32.* 1923.—A list of available crops is given with tabulated data concerning time to pasture and to harvest, number of crops a year, carrying capacity and approximate gains of hogs per acre for each crop. More detailed data are given concerning methods of planting and utilizing the individual crops.—*J. M. Westgate.*

2176. Larwood, H. D. **Peas and their culture.** Jour. Dept. Agric. Western Australia 2nd Ser. **1**: 232–235. 1924.—Soil adaptation and cultural methods are discussed. A list of varieties with brief description of each is given.—*P. J. Olson.*

2177. Locke, Lowell F., and J. Allen Clark. **Development of wheat plants from seminal roots.** Jour. Amer. Soc. Agron. 16: 261–268. 1924.—Under normal conditions 2 kinds of roots are developed by the wheat plant. The 1st are seminal or seed roots and the 2nd are coronal or permanent roots. In 2 instances physical conditions have prevented or delayed the development of permanent roots. Under these conditions, the seminal roots furnished sufficient moisture to maintain the growth of the wheat plant to maturity or until rains occurred and permanent roots normally developed.—*F. M. Schertz.*

2178. Lowe, G. N. **Cultivation of the potato.** Jour. Dept. Agric. Western Australia 2nd Ser. 1: 229–230. 1924.—The importance of good seed is emphasized. Freedom from disease, as evidenced by the absence of skin lesions, or discolorations in the flesh is stressed. Mention is made of the superior yields obtained from seed dug before it is quite mature as compared with strictly mature seed.—*P. J. Olson.*

2179. Macself, A. J. Grass. *199 p. Illus.* Cecil Palmer, London. 1924.—In this book, "Grass," the author deals more with matters relating to the making and maintenance of lawns, golf courses, and other sport fields, than to detailed discussions of the various species of grasses used. Much of the book is composed of a discussion of methods and practices followed by English gardeners. In this respect it is like previous English works on turf. However, it exhibits an encouraging tendency toward skepticism regarding some of the established practices, which in turn leads the reader to the conclusion that there is still need for investigations in the subject of turf making.—*R. A. Oakley.*

2180. Marble, L. M. **Potato storage investigations during 1922–23.** Proc. 10th Ann. Meeting Potato Assoc. Amer. *P. 179–184.* 1923 [1924].—This paper is based on studies made in the author's storage house and laboratories at Canton, Pennsylvania. Two distinct phases of the subject were investigated: (1) A physiological study of the respiration of the potato under different holding temperatures, and also of the sugar and starch changes incident to low temperature holding; and (2) an observational study to determine the effect of ventilation on potatoes stored under a number of different conditions, and also to determine the relationship between the humidity of the potatoes stored in bins and that of the air in the open store room. Both phases of these investigations were carried on by Dr. E. F. Hopkins, the Irish Cobbler variety being used. The conclusions reached were that for long term holding, potatoes should be stored in crates or bags in a ventilated room. Bin storage is not to be recommended. Variations of humidity in a storage room are not harmful to potatoes if the humidity is not excessive.—*W. Stuart.*

2181. Martin, W. H. **Stabilizing the potato industry.** Proc. 10th Ann. Meeting Potato Assoc. Amer. *P. 80–85.* 1923 [1924].—The author calls attention to the fact that our potato acreage in 1866 was only 1,069,000 acres while in 1923 it was 4,228,000 acres and that during this period the per capita production is gradually moving westward. Production costs, disposition of surplus crops, factors contributing to low yields, etc., are also discussed.—*W. Stuart.*

2182. Meyer, A. J. **Coordinating the experiment station agronomy program and the extension program.** Jour. Amer. Soc. Agron. 16: 305–310. 1924.

2183. Meyers, Marion T. **The influence of broken pericarp on the germination and yield of corn.** Jour. Amer. Soc. Agron. 16: 540–550. 1924.—With broken seed coats the injury to the seedlings is greatly increased. Disease readings on the germination were no more discriminating than careful examination of the ears before testing. Under field conditions, reduced stands were obtained from seed with broken seed coats. Inoculation of broken seed with *Penicilium* sp. reduced the stand to 396 plants from a possible 837, and only 55% of these survived until harvest. Unbroken seed coats were completely protected against infection by the same spores.—*F. M. Schertz.*

2184. Morris, E. A. M. **A brief survey of Irish agriculture.** Jour. Dept. Agric. Ireland 23: 236–251. 1923.—The history of agriculture in Ireland and statistics as to the acreage, distribution of crops, and size of farms are given.—*Donald Folsom.*

2185. Morris, E. A. M. **Statistical notes on agriculture in the Irish Free State.** Jour. Dept. Agric. Ireland 23: 341–343. 1924.—The relative areas of land tabulated as to use or crop and as to size of farms are given.—*Donald Folsom.*

2186. Musbach, F. L., and M. L. King. **The weather as a factor in crop production.**

Jour. Amer. Soc. Agron. 16: 381–383. 1924.—This is a report of the effect of temperature and precipitation on the yields of corn during 1918, 1919 and 1920.—*F. M. Schertz.*

2187. Musgrave, George W. **Depression of check-row yields by adjoining high yielding plot rows in potatoes.** Jour. Amer. Soc. Agron. 16: 633–635. 1924.—Results for 1 year indicate that the check yield is depressed by the adjoining high yielding plot rows.—*F. M. Schertz.*

2188. National Institute of Agricultural Botany. **Fifth report of the council.** Rept. Nat. Inst. Agric. Bot. [England.] 5: 1–19. 1923–1924.—This includes reports of the crop improvement branch (permanent sub-stations, yield trials, multiplication of cereals for sale), the official seed testing station for England and Wales, potato testing work (yield and maturity trials, immunity trials against wart), potato synonyms committee, identification of potatoes, virus diseases, and demonstration plots).—*Frederick V. Rand.*

2189. Osborn, E. H. **Northern field assistant's report.** Australian Sugar Jour. 16: 381–383. 1924.—H. Q. 409 cane, planted extensively this year in the Herbert River District, is a cane of high density and is said to ratoon well. It is a slow striker and should be planted either very early or very late. It seems to do well in heavy soil.—Q. 813 has become popular in the District named, mainly because of its good striking properties and quick growth. It can be planted early or late, and in poor or medium heavy soils. Besides carrying a high density, it ratoons well.—Growers in the Lower Burdekin district claim good results from irrigation, which has improved the texture of the soil.—Top rot and leaf stripe were the diseases most in evidence in this district, the former being most prevalent on the Badila cane. Leaf stripe was most prevalent in B. 208, and occasionally Goru was attacked. In 1 instance 3 rows of Q. 908, separating badly affected 1st ratoons of B. 208 from N. G. 24 (Goru) showing strong signs of the disease, were quite free from infection.—*Nellie E. Fealy.*

2190. Patten, G. R. **A summary of some experiments carried out by the Bureau of Sugar Experiment Stations.** Queensland Agric. Jour. 20: 309–314. 1923.—Tables are given showing analyses of green manures and sisal hemp, the preserving action of different chemicals upon cane juices, and comparative analyses of the juices of the same varieties of cane expressed by 2 different mills at Mackay.—*W. D. Francis.*

2191. Pearson, F. A., and W. L. Gaines. **The evaluation of corn silage.** Jour. Amer. Soc. Agron. 16: 251–260. 1924.—Two methods are used to evaluate the cost of corn silage: (1) A cost accounting method in which the silage is charged with the value of the corn crop in the field at the time of silage harvest, and the cost of harvesting, storage, etc. (2) A nutritional method, in which the silage is converted into terms of shelled corn and hay on the basis of the digestible nutrients; the market value of these feeds, is then used to evaluate the silage. The 1st method gave a value of $4.53 per ton while the second method gave $4.59 per ton. The author recommends the corn-plus-hay evaluation of silage (per ton) by the formula $xC+2yH$, in which x is bushels of corn per ton of silage; C, the farm value of corn per bushel; y, the pounds of digestible nutrients in the non-grain portion of the ton of silage; and H, the farm value of hay per pound.—*F. M. Schertz.*

2192. Potts, A. S. **The lower Rio Grande valley of Texas.** Texas Agric. Exp. Sta. Circ. 34. *1–13.* 1924.—The author discusses the area 25–30 miles wide, 75 miles up from the mouth of the Rio Grand River, which would be greatly increased if a gravity system of irrigation were installed.—The soils vary from light sand to heavy clay, including dune sand and coastal beach, recent alluvial soils along the Rio Grande, old alluvial soils of the Rio Grande delta, and coastal prairie soils.—The average rainfall at Brownsville for 50 years is 24.15 inches, but it is quite variable. For example, 1922 had a rainfall of 38.69 inches. The mean temperature is 72–74°F., but severe cold periods are the limiting factor in citrus growth. A wide range of crops is grown, including corn, cotton, broomcorn and similar crops alternating with such vegetables as spinach, cabbage, onions.—*L. Pace.*

2193. Quanjer, H. M. **Some potato growing problems in Holland.** Proc. 10th Ann. Meeting Potato Assoc. Amer. *P. 190–194.* 1923 [1924].—The author discusses in a general way the potato growing problems of his country. The scientific aspects of potato culture have been principally directed along pathological lines. Degeneration diseases have received much consideration. Late blight is also an important factor. The large commercial potato production centers in Holland are on the peat lands of the northern part of the country.—*W. Stuart.*

2194. Quereau, Fred C. **Effect of salt water on the 1924 rice crop.** Rice Jour. 27: 13–14. 1924.—An earlier test was published in the Louisiana Bull. 171, 1920. In this case the fresh water was exhausted in June. The salt water was applied a month later, 50–200 grains of salt per gallon being present. The rice yield will be about 8 sacks per acre. Rice not irrigated either with salt water or from wells is a total loss. Two problems remain: (1) At what stage may salt water be used in irrigating rice; (2) what damage to the land results from the use of the salt water?—*L. Pace.*

2195. Rippel, August. **Versuche aus dem Nachlass von Alfred Koch.** [**Unpublished investigations of Alfred Koch.**] Jour. Landw. 72: 17–52. 1924.—The investigations include: 20 years experiments (1903–1923) with wheat and rye grown in the open field; experiments conducted in sunken metal cylinders; the yields of soils taken at different depths; influence of sugar, cellulose and straw upon the nitrogen content of the soil. The nitrogen question is discussed.—*F. M. Schertz.*

2196. Ripperton, J. C. **The Hawaiian tree fern as a commercial source of starch.** Hawaii Agric. Exp. Sta. Bull. 53. *1–16. 15 pl., 1 fig.* 1924.—In chemical composition the heart of the tree fern (*Cibotium* sp.) is similar to that of other starch crops such as the potato and edible canna. The heart or core weighs about 10 pounds to the running foot of log. The Hawaiian Islands contain many thousands of acres of tree ferns from which starch might be extracted if necessary. The average growth in height is 4.35 inches annually. The value of the trees for forest cover and the fact that it takes about 20 years to develop a tree fern to sufficient size for use precludes the present utilization of the tree fern for producing starch except where it is desirable to clear the forest for other purposes. The starch has proved satisfactory both for food and for laundry purposes, a 2% solution of tree fern starch showing a viscocity equal to a 3% solution of cornstarch. The human digestibility of raw tree fern starch is reported to be 93.4%. In event of serious interruption of shipping and the consequent cutting off of food supplies for the islands the tree ferns would undoubtedly prove a most valuable emergency food crop.—*J. M. Westgate.*

2197. Rosa, John T. **The potato variety situation in California.** Proc. 10th Ann. Meeting Potato Assoc. Amer. *P. 172–174.* 1923 [1924].—The Burbank group is considered the most important one grown in California. The varietal characteristics of Lo-top and Hi-top Burbanks are commented upon by the author as well as those of Pride of Multnomah, White Star, White Rose, Wisconsin Pride and Great Divide. Among other commercial varieties are Garnet Chili, Up-to-Date (erroneously called British Queen), Late Rose or Early Red Prizetaker, Charles Downing (Idaho Rural), Triumph, and American Wonder.—*W. Stuart.*

2198. Rudall, H. **Farmers' trials, northern and eastern areas.** Jour. Dept. Agric. Western Australia 2nd Ser. 1: 150–158. *7 fig.* 1924.—Wheat and oat variety trials, and fertilizer trials were carried out at several centers, representing 3 soil types, namely, heavy, scrub, plain, and sandy. The results given are for 1 year only and are, therefore, not conclusive.—*P. J. Olson.*

2199. Schreiner, O., and B. E. Brown. **Soil treatment for potato scab-control.** Proc. 10th Ann. Meeting Potato Assoc. Amer. *P. 139–156.* 1923 [1924].—The authors first review the literature on this subject and then proceed to submit experimental data secured from their experiments on Long Island, New York (1922–1923), and in Pennsylvania (1923).—*W. Stuart.*

2200. Schribaux, Emile. [**Rev. of: Ducellier. Culture du lin dans le Nord de l' Afrique. (Flax culture in North Africa.)** *39 p.* Bibliotheque du Colon du Nord de l'Afrique: Algiers, 1919.] Compt. Rend. Acad. Agric. France 6: 85–86. 1920.—Flax has long been grown in Africa for its seed, but now its culture for fibre purposes is being undertaken.—*Ernst A. Bessey.*

2201. Schultz, E. F. **Algunas plantas forrajeras poco apropiadas para Tucuman.** [**Some forage plants not appropriate for Tucuman.**] Rev. Indust. y Agric. Tucuman 13: 53–65. *5 fig.* 1922.—Experiments at the Tucuman Exp. Sta. have shown several forage crops to be unsuitable for use in this Province. Rescue grass (*Bromus unioloides*) gave poor yields and plantings were rapidly overrun by weeds. Reproduction was poor and the plants were destroyed by tramping of stock. Soybeans could be grown but cowpeas proved superior in many respects. Kudzu (*Pueraria hirsuta, P. thünbergiana*) grew slowly in dry weather, permitting weeds to

gain the ascendancy. Yields were very low even with irrigation. Spineless cactus (*Opuntia inermis*) was found of value only as a reserve or emergency crop and should be grown only on poor arid soils. It was very low in food value.—*John A. Stevenson.*

2202. Smith, W. D. **Available information regarding rice.** Rice Jour. 27: 22–23. 1924.—A list of bulletins largely from the U. S. Dept. Agric. is given, including some from Arkansas, California, Illinois, Louisiana, Florida, and Texas.—*L. Pace.*

2203. Snellen, E. **Over het groot-rijstbedrijf in Ned. Indie.** [**Extensive rice growing in Dutch India.**] West Indie 7: 72–79. 1922.—A description is given of rice growing in Java; these methods may be adapted to Suriname. A comparison of working methods used in Java and in Suriname is given.—*J. C. Th. Uphof.*

2204. Sparks, G. C., and J. A. O'Reilly. **Seed maize contest. Central New England, 1923–24.** Agric. Gaz. New South Wales 35: 693–695. 1924.—Seed of maize of different varieties was furnished by 12 competitors. The entire series of varieties was grown upon 3 different farms; yields are given.—*L. R. Waldron.*

2205. Stadtler, L. J. **An experimental study of the variety as an agronomic unit in wheat and oats.** Jour. Amer. Soc. Agron. 16: 366–372. 1924.—The experiment was conducted to determine the extent of variation in yield and other economic characters between pure and typical seed stocks within representative varieties of wheat and oats.—*F. M. Schertz.*

2206. Stewart, George, and D. W. Pittman. **Studies in the eradication of wild morning-glory.** Jour. Amer. Soc. Agron. 16: 506–518. 1924.—Evidently no satisfactory method has has been found for eradicating *Convolvulus sepium.*—*F. M. Schertz.*

2207. Stuart, W. **Relation of science to the potato industry, 1848–1923.** Proc. 10th Ann. Meeting Potato Assoc. Amer. *P. 194–208.* 1923 [1924].—For convenience of discussion the author divides the 75 years involved into 3 periods: (1) 1848–1875, (2) 1876–1900, and (3) 1901–1923. During the 1st period occurred the beginning of the development of American varieties of potatoes. In the 2nd period the invasion of the Colorado beetle led to the development of the use of poison sprays. The advent of the compound microscope also made possible the study of potato diseases and the development of remedial and control measures. Bordeaux mixture for the control of late blight, seed disinfection with corrosive sublimate and formalin solution were also developments of this period, as were also spray equipment, potato implements and additional new varieties. In the 3rd period the outstanding features were the potato breeding craze in Great Britain and America's reaction to it, seed potato inspection and certification, standardization of market grades, strain tests, discovery of new diseases, transportation agencies, and insect studies.—*Author.*

2208. Sutton, Geo. L. **Depth of plowing experiments.** Jour. Dept. Agric. Western Australia 2nd Ser. 1: 227. 1924.—At Merredin and Chapman, a comparison was made between 4, 6, and 8 inch plowing depth. A very slight advantage from deep plowing was noted at Chapman, but not at Merredin.—*P. J. Olson.*

2209. Sutton, Geo. L. **Experiments with wheat. The rotation experiments at Chapman and Merredin Experiment Farms.** Jour. Dept. Agric. Western Australia 2nd Ser. 1: 209–226. *9 fig.* 1924.—Four rotation systems were compared with continuous cropping. These systems involved the alternation of wheat with fallow, or of wheat with fallow and "renovating" or "change" crops. In all cases, wheat after fallow gave decidedly higher yields than continuous wheat. At Merredin, where the soil is relatively heavy and high in fertility, the introduction of a "renovating" or "change" crop into the rotation was not accompanied by significant increase in yields. At Chapman, however, where the soil is light and relatively low in fertility, the "change" crop was advantageous. Oats were found to be more satisfactory as a "change" crop than peas or rape.—*P. J. Olson.*

2210. Talmage, H. R. **Fertilizer practice on Long Island.** Proc. 10th Ann. Meeting Potato Assoc. Amer. *P. 114–117.* 1923 [1924].—Experience has demonstrated to the Long Island potato growers that the most satisfactory fertilizer for local use is one analyzing 5% nitrogen, 8% phosphoric acid, and 4% potash, or a 5-8-4 brand. The usual practice is to apply a ton per acre.—*W. Stuart.*

2211. Thatcher, R. W., L. R. Streeter, and R. C. Collison. **Factors which influence the nicotine content of tobacco grown for use as an insecticide.** Jour. Amer. Soc. Agron. 16:

459–466. 1924.—The investigations here reported clearly indicate that the nicotine content of any particular variety or crop of tobacco is very largely influenced by the plant food supply and climatic conditions under which it is grown. Selection of high nicotine content plants offers another possibility of increasing the nicotine content.—*F. M. Schertz.*

2212. Tolaas, A. G. **Report of committee on seed potato improvement and certification.** Proc. 10th Ann. Meeting Potato Assoc. Amer. *P. 50–75.* 1923 [1924].—This is a comprehensive survey of seed potato certification work in the U. S. A. and Canada. The certification requirements of each state and of the Canadian provinces are given. Figures are given relative to the acreage and quantity of certified seed potatoes produced in the U. S. A. and Canada, both collectively and by states.—*W. Stuart.*

2213. Toole, Eben H., and Pearl L. Drummond. **The germination of cottonseed.** Jour. Agric. Res. 28: 285–292. *2 pl.* 1924.—Cotton seed grown in Texas and surrounding states is often remarkably sensitive to conditions of germination, both in laboratory tests and in the field. The relation of micro-organisms, storage, temperature, germination and moisture, both previous to and during germination, to the peculiar behavior of these samples has been studied. Studies of the comparative germination in the laboratory and in the field show that these sensitive samples will produce a good field stand only under favorable conditions. Description is given of a method for testing cotton seed for germination, that will give a better idea of the field value of the seed than the one hitherto used.—*Eben H. Toole.*

2214. Watkins, W. R., and R. N. Makin. **Farmers' experiment plots. Sorghum trials, 1924.** Agric. Gaz. New South Wales 35: 699–704. 1924.—Detailed notes are given upon a number of sorghums grown for fodder. Maximum yields of over 26 tons of green fodder per acre were secured.—*L. R. Waldron.*

2215. Welton, F. A., and V. H. Morris. **Yields of wheat following potatoes and the relation of nitrates in the soil to these.** Jour. Amer. Soc. Agron. 16: 519–534. 1924.—Wheat following potatoes generally yields more than wheat following most other crops. The nitrate content of potato land is usually much higher than that of corn, oat, wheat, clover or soybean land. This may account for the relatively high yields of wheat frequently obtained following potatoes. High nitrate content of potato land may be due in part to the relatively small amount of nitrogen removed by the tubers and in part to the fallow condition during the last weeks of the potato crop.—*F. M. Schertz.*

2216. Wenholz, H. **Cotton growing in New South Wales. Some lessons of the past season.** Agric. Gaz. New South Wales 35: 685–692. 1924.—The experimental results secured from growing cotton during the past 2 seasons have, on the whole, been unfavorable. However, it has not yet been demonstrated that cotton growing under certain climatic and soil conditions may not be feasible in N. S. W.—*L. R. Waldron.*

2217. Wenholz, H. **Hickory King maize contest.** Agric. Gaz. New South Wales 35: 705–706. 1924.—This variety was grown by 7 competitors at 3 different places. The flour from Hickory King commands a premium upon the market, for milling purposes.—*L. R. Waldron.*

2218. Werner, H. O. **Seed stocks and factors affecting them.** Proc. 10th Ann. Meeting Potato Assoc. Amer. *P. 45–47.* 1923 [1924].—As a result of a more or less extensive study of degeneracy in western Nebraska seed stocks, the author is convinced that the running out of seed stock due to virus diseases is more rapid on irrigated land than under dry land conditions. Exception is noted in the case of the variety, Rural New Yorker No. 2, in the Greeley, Colorado, district where judicious use of water is practised. Climatic conditions are also regarded as a factor in degeneration. Variety and strain tests are also discussed.—*W. Stuart.*

2219. Wheeler, H. J. **Fertilizing the potato crop.** Proc. 10th Ann. Meeting Potato Assoc. Amer. *P. 92–96.* 1923 [1924].—The author says that fertilizing the potato crop is very largely a sectional problem. Fertilizer practices in vogue in various sections are discussed. The great problem in potato production is to get the largest and best quality crop with a maximum of profit. The proper compounding of commercial fertilizers is therefore of prime importance. Thorough mixing of the commercial fertilizer with the soil is especially advocated.—*W. Stuart.*

2220. White, C. T. **Weeds of Queensland.** Queensland Agric. Jour. 21: 252–253.

Pl. 49. 1924.—The occurrence, distribution, economic uses, and eradication of the native cinchona or quinine (*Alstonia constricta*) are outlined.—*W. D. Francis.*

2221. White, C. T. **Weeds of Queensland.** Queensland Agric. Jour. **21**: 284–285. *Pl. 54.* 1924.—The description, distribution, properties and eradication of *Heliotropium anchusaefolium* are outlined. The species is illustrated by a photograph.—*W. D. Francis.*

2222. Whittet, J. N. **Western grasses, fodder plants, and fodder trees. Investigational work in New South Wales.** Agric. Gaz. New South Wales **35**: 715–722. *6 fig.* 1924.—The most valuable native grasses found for pasture purposes in N. S. W. are enumerated and notes upon them given. On areas which have been greatly overstocked, valuable native grasses have been largely replaced by certain inferior plants, such as *Salsola Kali* and *Portulaca oleracea.* Only a few introduced grasses have been found suitable in drier parts of New South Wales. Some non-grass plants found in certain grazing areas have proved to be valuable and certain fodder trees are recognized as valuable supplements to the ordinary pasture plants.—*L. R. Waldron.*

2223. Wilson, Oswald. **Do sugar beets pay?** Internat. Sugar Jour. **26**: 428–430. 1924., —A discussion of the sugar beet from the dietetic and economic standpoints is given.—*Nellie E. Fealy.*

2224. Wolfe, T. K. **The effect of fertilizers on the yield and the ear characters of corn.** Jour. Amer. Soc. Agron. **16**: 551–552. 1924.—Fertilizers which affect yield favorably also apparently have a favorable effect on the ear characters.—*F. M. Schertz.*

2225. Worthen, E. L. **Opportunities for self improvement which should be offered the agronomy specialist.** Jour. Amer. Soc. Agron. **16**: 331–335. 1924.—This paper was read as a part of the symposium on Extension Work in Agronomy at the meeting of the Society held in Chicago, Illinois, in 1923. A program is suggested looking toward a broadening and perfecting of the work of the agronomy extension specialist.—*F. M. Schertz.*

SOIL SCIENCE (EDAPHOLOGY)

2226. Anonymous. **Cultivation and fertilising. Nitrate of soda supplies.** Australian Sugar Jour. **16**: 334. 1924.—Statistics are given regarding the Chilean nitrate production.—*Nellie E. Fealy.*

2227. Anonymous. **Green manuring for cane crops.** Australian Sugar Jour. **16**: 391–392. 1924.—Gradual diminution in the beneficial results obtained from the use of artificial fertilizers results from the lack of humus in the soil, due to the fact that the last ratoon of a crop is now invariably burned and there is no trash to plough in, and to the further fact that growing and turning under a crop of beans or peas is not now practiced. It appears necessary that the recently acquired habit of ploughing out and planting the same season, which has come into vogue through the more general production of late-planted and quick-growing varieties, must be abandoned. Farmers should endeavor to get in 1 if not 2 green crops ploughed in before planting.—*Nellie E. Fealy.*

2228. Atkins, W. R. G. **Solubility of phosphates in relation to hydrogen ion concentration.** Nature **114**: 275. 1924.

2229. Barnes, Earl E. **Effect on permanent pastures of treatments with limestone and acid phosphate as measured by the quantity and quality of the vegetation produced.** Jour. Amer. Soc. Agron. **16**: 241–251. 1924.—Applications of limestone and acid phosphate to "worn out" pastures in southern Ohio caused an immediate increase in the percentage of legumes. This is followed by a renewal of the bluegrass sod, which does not reach its optimum until at least the end of the 4th summer after treatment. The greatest difference in chemical composition between the vegetation produced on treated and untreated portions of the same field is found in the percentage content of N. The percentage increase in the content of Ca in the vegetation as a result of an acid phosphate and limestone treatment, is greater than the percentage increase in its content of P_2O_5.—*F. M. Schertz.*

2230. Bennett, Hugh H. **The relation of the soil survey to the utilization of southern soils.** Jour. Amer. Soc. Agron. **16**: 421–428. 1924. The writer discusses the soil survey as an aid to the farmer in choosing his crops to fit his soil type.—*F. M. Schertz.*

2231. Blanck, E., and F. Alten. **Ein Beitrag zur Frage nach der Einwirkung des Titans auf die Pflanzenproduktion.** [The effect of titanium upon plant production.] Jour. Landw. 72: 103-110. 1924. No influence was exerted upon plant production by Na_2TiO_3 when applied either with or without fertilizers.—*F. M. Schertz.*

2232. Carr, R. H., and H. G. Havercamp. **Modifications of plant growth and ash content as affected by acids added to soils.** Jour. Amer. Soc. Agron. 16: 278–283. 1924.—A comparison has been made of the effect upon the growth of soy bean and buckwheat plants by adding an organic (acetic) acid and an inorganic (sulphuric) acid to a silt and clay-loam soil. Both acids seriously interfere with plant growth; acetic acid was the more deleterious, probably due to the fact that the acetic acid supplied more toxic Al and Fe to the plant and decreased the supply of Ca and Mg more than did H_2SO_4. Phosphoric and silicic acids were also used because they make compounds with Al and Fe which seem to be harmless to the growing plant, regardless of the fact that the root is surrounded by a soil which is highly acid. The good growth obtained indicates that relatively insoluble compounds of Al and Fe were formed and that the acid as such did no harm.—*F. M. Schertz.*

2233. Chiriţescu-Arva, M. **Doctrine şi direcţiuni în studiul pământurilor.** [Doctrines and directions in the study of the soils.] Bul. Agric. [Bucureşti] 3: 49–72; and 4: 7–44. 1922.—After a short history of agriculture, from antiquity to the middle ages, the author traces systematically the evolution of the study of the soil in modern times, insisting on the 3 principal doctrines: (1) chemical, (2) geological, and (3) natural agents. In the last chapter he criticizes these doctrines and shows the importance and legitimacy of a newer aspect of pedology; namely the plant physiological, as advocated by Mitscherlich.—A literature list is appended.—*E. Pop.*

2234. Deatrick, E. P., and O. C. Bryan. **A rapid method of taking soil samples from field plots.** Jour. Amer. Soc. Agron. 16: 486–488. 1924.

2235. Fraps, G. S. **The soils of Brazos, Camp, Ellis and Washington counties.** Texas Agric. Exp. Sta. Bull. 316. *1–88.* 1924.—The chief essentials for the maintenance of fertility are. (1) The maintenance of the supply of nitrogen and humus in the soil by growing legumes in a proper rotation; (2) correction of deficiency of phosphoric acid in the soil by proper use of a phosphatic fertilizer; (3) correction of acidity of the soils by use of lime; and (4) correction for potash deficiency by use of potash fertilizers.—*L. Pace.*

2236. Freeman, J. F. **Nitrogen in the rainwater at different points in Kentucky.** Jour. Amer. Soc. Agron. 16: 356–358. 1924.—With an average rainfall of 42.76 inches for the year April 1, 1922, to April 1, 1923, in 6 different locations in Kentucky, the soil received an average of 18.78 pounds of N per acre. Of this amount, 11.61 pounds were in the form of ammoniacal N and 7.17 pounds were in the form of nitrate N.—*F. M. Schertz.*

2237. Gahm, W. F. **The Scioto County, Ohio, soil improvement programs. 1918–1923.** Jour. Amer. Soc. Agron. 16: 335–352. 1924.—This is a brief outline of the needs of the County and a discussion of the means employed by the County Agricultural Agent to secure the desired results.—*A. G. McCall.*

2238. Hartwell, B. L., S. C. Damon, and F. K. Crandall. **Field crop response to the ingredients of potassium salts.** Jour. Amer. Soc. Agron. 16: 660–665. 1924.—In these experiments, K, Na, Mg, S, or Cl was added to 1 or more of the commercial potassium salts, kainit, muriate, sulphate and magnesium-potassium sulphate or double manure salt. The effect on the crop growth was measured by comparison with the crops produced where only the basic fertilizer was used. During the last 5 years, if the average percentage increase due to the magnesium-potassium sulphate is represented by 100, that with K_2SO_4 equals 109; that with KCl, 113; and that with kainit, 135.—*F. M. Schertz.*

2239. Johnson, E. M. **Sulfur in rainfall in Kentucky.** Jour. Amer. Soc. Agron. 16: 353–356. 1924.—The S content of rainfall is greater in the winter than in the summer, and in the vinicity of railroads and cities. Yearly estimates of the S in rainfall based on the analyses of a few collections are inaccurate.—*F. M. Schertz.*

2240. Kadish, Victor H. **Activated sludge as fertilizer.** Milwaukee Sewerage Commission. Water Works Issue, Engineering and Contracting 62: 817–820. 1924.—Dry fertilizer material, approximately 100 tons daily, will be produced at Milwaukee when the new activated

sludge plant serving a population of 600,000 and many industrial plants, is placed in operation. With a view to marketing the product commercially, studies upon the production of a sludge with the highest possible fertilizing value and investigation of the fertilizing value of the sludge actually produced, by means of pot tests and field experiments, have been made at the activated sludge sewage disposal plant at Milwaukee. Extensive experiments on lawns and golf courses have indicated that this activated sludge has a definite fertilizer value, in some cases greater than commercial brands on the market.—*E. S. Tisdale* [*Public Health Engineering Absts.*].

2241. Kelley, Walter P., and S. Melvin Brown. **Replaceable bases in soils.** California Agric. Exp. Sta. Tech. Paper 15. *1–39.* 1924.—When neutral salt solutions are used on soils, the reactions which take place may be of the nature of an exchange of bases, and the bases thus brought into solution are referred to as being replaced. This paper is a study of the bases present in replaceable form in (1) normal soils of neutral or akaline reaction, (2) alkali soils, (3) acid soils. The method used was that of leaching a sample of the soil with NH_4Cl and then determining the amount of NH_4 absorbed. This amount is chemically equivalent to the sum of all the bases replaced. When $CaCO_3$ was present in the soil, correction was made for the amount dissolved by NH_4Cl, calculated from CO_2 determinations made before and after the extraction. Results showed that the replaceable bases in the soils of neutral or alkaline reaction are composed largely of Ca, with less Mg and a small amount of K and Na. The alkali soils contained a large amount of replaceable Na with a very small amount of Ca. In these soils the amount of soluble salts present may change the relationship between the several replaceable bases. That this fact has a practical application in the reclamation of alkali soils is pointed out by the authors. Acid soils contained a low content of replaceable bases, with Al, Fe or Mn constituting 50% or more of the total. When some acid soils were treated with $Ca(OH)_2$ before extracting with NH_4Cl, a larger amount of replaceable Ca was found, but this is not characteristic of all acid soils.—The authors conclude that the greater part of the replaceable bases are in the finer fractions of the soils. They are considered as not in a state of physical adsorption, but are present as chemical compounds. There is a general discussion of the theories advanced by other workers on replacement reactions, and a bibliography is given.—*Margaret Buvens.*

2242. Kerr, H. W. **On soil acidity.** Queensland Agric. Jour. 21: 413–415. 1924.—A report on the investigations of the acidity of samples of soils from sugar growing districts of Queensland is given.—*W. D. Francis.*

2243. Lyon, T. L., J. A. Bizzell, and B. D. Wilson. **An inquiry into the reason for the large accumulation of nitrates in soil following the growth of clover or alfalfa.** Jour. Amer. Soc. Agron. 16: 396-405. 1924.—The rapid and large accumulation of nitrates in soil previously planted to clover or alfalfa, as compared with soil previously in timothy, appears to be connected with the higher N content of the former. This condition is not necessarily associated with a larger total quantity of N in the legume soil, but rather with its smaller quantity of non-nitrogenous organic matter.—*F. M. Schertz.*

2244. McGeorge, W. T. **A study of the phosphates in the (Hawaiian) island sugar lands.** Exp. Sta. Hawaiian Sugar Planters' Assoc. Agric. and Chem. Ser. Bull. 47. *1–51. 2 fig.* 1923.—Although it is customary to apply phosphate fertilizers to sugar cane lands, the numerous field experiments indicate that only a small percentage show a profitable return. The phosphate requirement of sugar cane is comparatively low and the sugar cane plant apparently has a high feeding power for the phosphates even though they be of low availability.—*J. M. Westgate.*

2245. McGeorge, W. T. **The availability of potash in Hawaiian soils; soil analysis and potash deficiencies.** Exp. Sta. Hawaiian Sugar Planters' Assoc. Agric. and Chem. Ser. Bull. 48. *1–24.* 1924.—Field experiments indicate that a majority of Hawaiian soils do not respond to potash fertilization. Analyses indicate a high potash reserve in the soils. The availability of the potash appears to be related to the presence or absence of lime. There is also some indication that there is a greater availability of potash in the clay types of soil, but the solubility of silica appears to be without effect upon the potash.—*J. M. Westgate.*

2246. Manns, T. F. **Possibilities and limitations of bacterized peat.** Jour. Amer. Peat

Soc. 17: 81–104. 1924.—Muck humus reinforced and composted gave splendid crop response to rye and millet without the addition of nitrogen, indicating it to be a product of good fertilizing value. Methods of composting, reinforcing and inoculating peat are given, accompanied by tabulated data from experimental work at the Ohio and Delaware Agric. Exp. Stations.—*G. B. Rigg.*

2247. Morgan, M. Francis. **Land cover studies as a basis for a more accurate interpretation of the soil survey.** Jour. Amer. Soc. Agron. 16: 452–458. 1924.

2248. Murphy, Henry. **Nitrification studies with Yahola soils.** Jour. Amer. Soc. Agron. 16: 301–304. 1924.—Generally, soils which received the heavier applications of lime produced the largest amount of nitrates. Nitrification was not increased to any great extent when manure was used in connection with lime.—*F. M. Schertz.*

2249. Murphy, Henry F. **The nitrogen content of Kirkland silt loam as influenced by different cropping and soil treatment.** Jour. Amer. Soc. Agron 16: 363–366. 1924.—Cereals reduced the N content of the soil by 33 pounds per acre annually, while land growing alfalfa showed a gain in N content. Lime tended to increase bacteral activity and nitrogen fixation.—*F. M. Schertz.*

2250. Murray, J. C. **Southern field assistant.** Australian Sugar Jour. 16: 283, 390. 1924.—In the Bundaberg district good results were obtained from fertilizing cane land with sulphate of potash. In one instance the application of this fertilizer at the rate of 300 pounds per acre before planting gave marked results.—*Nellie E. Fealy.*

2251. Niklas, H. **Eine einfache neue Methode zur Bestimmung der Reaktion eines Bodens.** [**A new simple method for determining soil reaction.**] Forstwiss. Centralbl. 46: 471–474. 1924.—The results are given of tests by the method for determining acidity recently proposed by Comber. By shaking a few grams of soil in a test-tube with a 5% solution of potassium salicylate in water, it is possible to get from the color reaction a fairly close idea of the degree of acidity within a range of pH 5.8–7.2.—*W. N. Sparhawk.*

2252. Niklas, H. **Eine einfache Methode zur Feststellung des Nährstoffbedürfnisses der Böden, insbesondere an Kali und Phosphorsäure.** [**A simple method of determining the plant food requirements of soils, especially deficiencies in potash and phosphoric acid.**] Forstwiss. Centralbl. 46: 509–511. 1924.—While of less importance in forestry than in agriculture, knowledge of the kinds and amounts of plant food lacking in a soil should be of great value in establishing and fertilizing forest nurseries. Neubauer's method of determining the available plant food by germinating rye is described, and the author's and Christensen's experiments in growing *Azotobacter* are mentioned.—*W. N. Sparhawk.*

2253. Niklas, H., und A. Hock. **Ein allgemeiner Indikator als wesentlicher Fortschritt bei der Reaktionsbestimmung der Böden.** [**A general indicator for the determination of soil reactions.**] Forstwiss. Centralbl. 46: 392–394. 1924.—The indicator is a mixture of bromophenol blue, bromocresol purple, methyl red, and bromothymol blue in the proportion 4:1:6:4, using a 0.02% solution (in alcohol) of methyl red and 0.04% solutions of the other 3 indicators. For "buffer" mixtures, citrate solutions give best results for pH values of 3.5–5.0; and phosphate mixtures, for pH 5.0–7.6. Values obtained with this indicator vary only by 0.1–0.15 pH units from those obtained with the Clark or Michaelis series, which require 5 and 4 indicators, respectively.—*W. N. Sparhawk.*

2254. Nolte, O. **Beiträge zur Phosphorsäurefrage.** [**Contribution to the phosphoric acid question.**] Mitteil. Deutsch. Landw. Ges. 39: 708–711. 1924.—The author cites the results of a large number of fertilizer experiments with, wheat, sugar beets, rye, peas, red clover, and horse beans, as bearing upon the accumulation of phosphorus in the soil as the result of heavy previous applications. He concludes that while in many cases the application of phosphorus has not been profitable, the results depend so much on local conditions that advice to the farmer not to use phosphatic fertilizers is not justified.—*A. J. Pieters.*

2255. Redfield, A. H. **Peat in the Netherlands.** Jour. Amer. Peat Soc. 17: 108–118. 1924.

2256. Rice, Thos. D. **The relation of the soil survey to the settlement of unused lands.** Jour. Amer. Soc. Agron. 16: 416–421. 1924.—The writer discusses the extent to which the soil survey may be used as a guide for prospective settlers on new lands.—*F. M. Schertz.*

2257. Shedd, O. M. **The determination of nitrate and ammonia in nitrogenous materials.** Jour. Agric. Res. 28: 527–539. 1924.—A modification of Strowd's Devarda alloy method (Soil Sci. 10: 333–342. 1920), in which the period of the preliminary alkaline digestion of the sample with Devarda alloy was increased before heating to reduce the nitrate, gave more concordant and generally higher results for nitrate in cured tobacco than did the original method. The modified method is also applicable to commercial fertilizers and, when so employed, the control determination, which is conducted to estimate the nitrate present, can be used to determine the ammoniacal nitrogen in fertilizers which contain both ammonium salts and nitrate.—*Author.*

2258. Thomas, G. H. E. **Bacterized peat as a fertilizing medium.** Jour. Amer. Peat Soc. 17: 105–107. 1924.—The author gives data on beneficial results of soil inoculation and of the application of organic fertilizers. The commercial distribution of agricultural bacterial products is discussed.—*G. B. Rigg.*

2259. Whitney, Milton D. **The future of the soil survey in our national agricultural policy.** Jour. Amer. Soc. Agron. 16: 409–412. 1924.—Great advances in our agriculture are predicted, through utilization of the soil surveys.—*F. M. Schertz.*

2260. Whitney, Milton. **The use of concentrated fertilizer and of special chemicals for soil treatment.** Jour. Amer. Soc. Agron. 16: 292–301. 1924.—This is a discussion supporting the use of concentrated fertilizers such as ammonium nitrate, ammonium phosphate, potassium phosphate and potassium nitrate.—*F. M. Schertz.*

2261. Whitson, A. R. **Difficulties in utilizing the work of the soil survey.** Jour. Amer. Soc. Agron. 16: 413–416. 1924.

2262. Williams, C. B. **How the soil survey is proving most valuable to North Carolina.** Jour. Amer. Soc. Agron. 16: 447–451. 1924.

2263. Wolfe, T. K. **The use of the words "analysis" and "formula" in reference to commercial fertilizers.** Jour. Amer. Soc. Agron. 16: 372–373. 1924.—The derivation of the words and present usage indicate that, so far as commercial fertilizers are concerned, the word "analysis" should be used to refer to the percentages of ammonia, phosphoric acid and potash and the word "formula" to the receipt for compounding the mixture.—*F. M. Schertz.*

BIBLIOGRAPHY, BIOGRAPHY AND HISTORY

Carroll W. Dodge, *Editor*

Charles A. Weatherby, *Assistant Editor*

(See also in this issue Entries 2184, 2202, 2207, 2514, 2544, 2662, 2777, 2781)

2264. Anonymous. **Adolfo F. Moller.** Brotéria (Sér. Bot) 21: 88–90. 1924.—Moller (1842–1920), after holding several minor silvicultural positions in the government service, became in 1874 Inspector of the Botanical Garden of the University of Coimbra. While there he actively studied the Portuguese flora, visiting all sections of the country and collecting extensively. He published a "Catalogue of the medicinal plants of Portugal," as well as many articles in various Portuguese journals devoted to horticulture or pharmacy. —*E. B. Chamberlain.*

2265. Anonymous. **Isaac Bayley Balfour.** Kew Bull. 1923: 30–35. 1923.—Balfour was born March 31, 1853, and died November 30, 1922. He was educated at Edinburgh, Strasbourg and Würzburg. In 1879 he became professor of botany at Glasgow, in 1884 at Oxford, and in 1888 at Edinburgh where he remained 34 years. In 1880 he visited the island of Socotra where he made many important discoveries. He was a co-founder of the "Annals of botany" and made translations of important German textbooks. At Edinburgh he developed a botanic garden of 1st importance. He was an authority on the flora of southwest China as well as a number of difficult groups of plants.—*T. J. Fitzpatrick.*

2266. Anonymous. **Richard Arnold Dummer.** Kew Bull. 1923: 94. 1923.—This is a short note on the botanical work of Dummer whose death through a motor accident recently occurred in Uganda.—*T. J. Fitzpatrick.*

2267. Anonymous. **Sir Harry James Veitch.** Nature 114: 95–96. 1924.—Veitch, who died July 6, in his 85th year, was a business man rather than a scientist, but under his direction many contributions to horticulture and botany were made. The 1st hybrid orchid, *Calantha Dominii* was grown under his direction.—*O. A. Stevens.*

2268. Anonymous. **The Trinidad College Principal.** Internat. Sugar Jour. 26: 346–347. 1924.—Announcement is made of the appointment of Martin Leake as principal of the Imperial College of Tropical Agriculture, Trinidad, and a brief biographical sketch is given of Francis Watts, retired.—*Nellie E. Fealy.*

2269. Anonymous. **William Robson.** Kew Bull. 1923: 238, 239. 1923.—William Robson, agricultural superintendent, Montserrat, West Indies died on April 22, 1923. He had wide agricultural interests but is particularly remembered for developing a strain of cotton well suited to the requirements of the island.—*T. J. Fitzpatrick.*

2270. Baker, Ray Palmer. **A chapter in American education.** *170 p.* Chas Scribner's Sons: New York, 1924.—In discussing the history and work of the Rensselaer Polytechnic Institute, much information is given, particularly in chapters 1 and 3, about the work and influence of Amos Eaton (1776–1842), the earliest and perhaps the greatest of popular botanical teachers in America.—*Neil E. Stevens.*

2271. B[aker], R. S. **Dr. William James Beal.** Science 59: 522. 1924.—Beal was an early student of Agassiz and Gray at Harvard and for 40 years was professor of botany at Michigan Agricultural College. He died May 12, 1924 at Amherst, Massachusetts, aged 91 years.—*C. J. Lyon.*

2272. Balfour, F. R. S. **Henry John Elwes.** Kew Bull. 1923: 36–43. 1923.—The death of Elwes occurred on November 26, 1922, at the age of 76. He was a noted traveller, a student of trees, lilies, Lepidoptera, and birds. For nearly 50 years he was a correspondent of Kew. He was educated at Eton and his travels were world wide. He made numerous botanical discoveries in all the countries he visited and introduced many species to cultivation. He, with Henry, produced the monumental work, "The trees of Great Britain and Ireland," and with Baker the monograph on the genus *Lilium.*—*T. J. Fitzpatrick.*

2273. Barclay, John. **The history, work and progress of the Jamaica Agricultural Society.** Jour. Jamaica Agric. Soc. 28: 109–115. 1924.—The author outlines the history of the Jamaica Agric. Soc. since its inception in 1895. It now has 267 branches with 7621 members and 57 agricultural instructors. In addition to the regular meetings, the Society and its branches conduct agricultural shows and competitions.—*John A. Stevenson.*

2274. Berkeley, L. E. D. **The invention of the resin-pot at Bayonne.** Quart. Jour. Forest. 18: 94–95. 1924.

2275. Brown, Ernest William, Henry Andrews Bumstead, John Johnston, Frank Schlesinger, Herbert Ernest Gregory, and Lorande Loss Woodruff. **The development of the sciences.** *xiv + 327 p.* Yale Univ. Press: New Haven. Oxford Univ. Press: London, 1923.—The chapter on biology by L. L. Woodruff gives a summary of the main lines of development of biology from the Greek period to the present. The appendix contains short biographies of many botanists.—*C. W. Dodge.*

2276. Chevalier, Aug. **Notice nécrologique sur l'abbé Letacq.** [**Notice of the death of A. L. Letacq.**] Bull. Soc. Bot. France 70: 690–691. 1923.—This article notes the death of A. L. Letacq in Oct. 1923, and mentions his principal work: "Inventaire des plantes phanerogames et cryptogames vasculaires du departement de l'Orne." [Inventory of the phanerogamic and cryptogamic plants of Orne.]—*P. A. Young.*

2277. Chevalier, Aug. **Notice nécrologique sur Louis Capitaine.** [**Notice of the death of Louis Capitaine.**] Bull. Soc. Bot. France 70: 692. 1923.—The author announces the death of Louis Capitaine in Oct. 1923, and cites his publications.—*P. A. Young.*

2278. Christensen, Harold R. **Referater af fremmed litteratur.** [**References to foreign literature.**] Tidsskr. Planteavl 30: 533–536. 1924.—This includes a number of abstracts, in Danish, of the results of important, foreign research.—*Albert A. Hansen.*

2279. Dimmock, Thomas, **Henry Shaw.** Missouri Bot. Gard. Bull. 12: 107–124. *Pl. 33.* 1924.—This biographical sketch is reprinted from Ann. Rept. Missouri Bot. Gard. 1: 7–25. 1890.—*O. T. Wilson.*

2280. Флеров, Б. К. [Flerov, B. K.] **Литературные данные о грибах Московской губернии.** [Literature on the fungi of Moscow Province.] Труды секции по Микологии и фитопатологии Русского Ботанического Общества. Труды Московского Отделения. [Trav. Sect. Mycol. & Phytopath. Soc. Bot. Russie. Trav. Div. Moscou] 1: 101–105. 1923.—This article is a brief discussion of the principal contributions, with a biblilgraphy of 42 titles.—*C. W. Dodge.*

2281. Fournier, P. **Les premiers dessins de Bulliard.** [The first drawings of Bulliard.] Bull. Soc. Bot. France 69: 216–220. 1922.—A brief biography of Bulliard is given. The article refers chiefly to 3 albums of colored drawings of medicinal plants.—*P. A. Young.*

2282. Gandoger, Michel. **Un peu de bibliographie et d'iconographie botaniques.** [A little botanical bibliography and iconography.] Bull. Soc. Bot. France 70: 665–670. 1923.—This article contains much valuable information concerning the botanists in the different parts of the world; also botanical publications, herbaria, and icones.—*P. A. Young.*

2283. Hering, Daniel W. **Foibles and fallacies of science: an account of celebrated scientific vagaries.** *xiii + 294 p.* D. Van Nostrand Company: New York. John Murray: London, 1924.

2284. Levene, P. A. **Jacques Loeb, the man.** Science 59: 427–428. 1924.—This short appreciation is written by a close friend who calls attention to the ideals, methods and personal traits of Jacques Loeb.—*C. J. Lyon.*

2285. McKibbin, C. W. **William James Beal, Michigan's pioneer forester.** Amer. Forests and Forest Life 30: 216–217. *2 fig.* 1924.

2286. Maire, René, et Louis Trabut. **Jules-Aimé Battandier (1848–1922).** Bull. Soc. Bot. France 70: 106–117. 1923.—This paper consists of a biography of J.-A. Battandier and a bibliography of his publications.—*P. A. Young.*

2287. Marquand, C. V. B. **The Lloyd herbarium.** Kew Bull. 1923: 189–190. 1923.—This is a short account of a collection of British plants made by George Lloyd, mostly between 1825 and 1843, and which has recently become the property of the Royal Botanic Gardens, Kew. The article includes an annotated list of 9 species which are now extinct in the British Isles.—*T. J. Fitzpatrick.*

2288. Osterhout, W. J. V. **Jacques Loeb, the scientist.** Science 59: 428–430. 1924.—This is a summary of the career of this scientist commencing with his early education in Germany. Particular mention is made of his work on tropisms, antagonism, artificial parthenogenesis, permeability, regeneration, osmosis and colloids.—*C. J. Lyon.*

2289. S[cott], D. H. **Dr. Robert Kidston, F. R. S.** Nature 114: 321–322. 1924.—Kidston, who died suddenly on July 13 while investigating fossils in South Wales, was one of the foremost authorities in paleobotany. He was born at Renfrewshire June 29, 1852, and spent his early life at Sterling. He was at first in the banking business, but attended Edinburgh University about 1878 and thereafter gave his time to botanical work. He published many papers from 1880 onward, those to 1904 dealing with floristic and stratigraphical studies. In his later papers he held a leading place in matters of morphology and affinity. He had a special interest in fern and fern-like plants, and was the 1st to demonstrate by direct proof of continuity that a fern-like plant of the coal age bore seed. He published also with other English and continental botanists. His work with W. H. Lang on the plants of the Old Red Sandstone of the Rhynie Chert-bed was the greatest of all. At the time of his death he was engaged upon a monograph of the Carboniferous plants of Great Britain. Kidston was a skilled photographer, an accomplishment which added greatly to the value of his publications.—*O. A. Stevens.*

2290. Singer, Charles. **The early microscopists.** Jour. Queckett Microsc. Club II, 15: 27–30. 1924.—The 1st authentic instance of the use of lenses occurred during the 1st century of our era. Convex spectacles were introduced about 1300 and concave spectacles about 200 years later. De la Porta suggested the 1st combination of lenses and Jansen, Galileo and Kepler developed both telescope and microscope during the early part of the 17th century. The contributions of Cesi, Kircher, Hooke, Malpighi, Grew, Leeuwenhoeck, Swammerdam and others to microscopy are briefly described.—*L. B. Walker.*

2291. Sprague, T. A. **F. W. Birschel.** Kew Bull. 1923: 351. 1923.—This article gives a few facts concerning Birschel, a collector of Venezuelan plants in 1854.—*T. J. Fitzpatrick.*

2292. Steele, Robert. **Mediaeval lore from Bartholomew Anglicus.** *195 p.* Chatto & Windus: London, 1924.

2293. Trelease, William. **Romeyn Beck Hough, 1857–1924.** Science 60: 397–398. 1924.—Hough never was interested in teaching dendrology or in details of nomenclature. He gave us numerous monographs and manuals of North American trees and his fascicles of thin sections of woods are particularly valuable contributions.—*C. J. Lyon.*

2294. Wright, C. H. **Original drawings of the Botanical Magazine.** Kew Bull. 1923: 176. 1923.—This is a short account of a recent acquisition by the Kew Herbarium of original drawings with names of the artists.—*T. J. Fitzpatrick.*

BOTANICAL EDUCATION

C. Stuart Gager, *Editor*

Arthur H. Graves, *Assistant Editor*

(See also in this issue Entries 2116, 2118, 2122, 2132, 2182, 2225, 2268, 2270, 2271, 2364, 2434, 2446, 2502, 2514, 2556, 2604, 2763)

2295. Anonymous. **Peradeniya, new laboratories.** Kew Bull. 1923: 63–64. 1924.—This is a short account of the new laboratories for entomology and mycology in the century-old Royal Botanic Gardens of Ceylon.—*T. J. Fitzpatrick.*

2296. Anonymous. **The Imperial College of Tropical Agriculture. The prospectus for 1924–25.** Internat. Sugar Jour. 26: 403, 409–411. *1 pl.* 1924.—For the purpose of emphasizing its Imperial nature, the West Indian College of Tropical Agriculture has been renamed the Imperial College of Tropical Agriculture. Details regarding the curriculum, taken from the Prospectus for 1924–25, are given.—*Nellie E. Fealy.*

2297. Anonymous. **The Trinidad Agricultural College.** Internat. Sugar Jour. 26: 347–348. 1924.—The plea of Lord Milner, head of a committee created at the instance of the Colonial Office for securing funds with which to enable the Trinidad Agricultural College to fulfil its functions as an Imperial institution, is brought before the public. The sources and amounts of revenue received by the College are indicated, and stress is laid on the necessity of contributions for the new institution, "which in the opinion of Sir Arthur Shipley, its chairman, is in its organization and range of instruction unique within the British Empire as a school of Tropical Agriculture."—*Nellie E. Fealy.*

2298. Anonymous. [Rev. of: Aberhalden, Emil (Editor). **Handbuch der biologischen Arbeitsmethoden.** Abt. 11. (Handbook of biological research methods.) **Methoden zur Erforschung der Leistungen des Pflanzenorganismus.** Teil 1, Hft. 7 (Schluss). (Methods for investigation of the activities of plant organisms.)—**Experimentelle Physiologie der Pflanzenzelle.** (Experimental Physiology of plant cells.) By Ernst Kuster. **Serum-Reaktionen zur Feststellung von Verwandtschaftsverhältnissen im Pflanzenreich.** (Serum reactions in the establishment of relationships in the plant kingdom.) By Carl Metz. *961–1123 + xxiv p.* Urban & Schwarzenberg: Berlin. 1924.] Nature 114: 747. 1924.—"The main part of this monograph may be useful as bringing together data upon a number of different technical methods scattered widely through the literature. . . The brief monograph upon serum diagnosis is confined strictly to a practical account of the method as employed by Metz, who has injected plant extracts into dogs and afterwards, by use of precipitin and agglutinin reactions with serum from the animal, investigated extracts of other plants as to their biological similarity. . . This biochemical method is thus embodied in the current classification of the plants."—*Frederick V. Rand.*

2299. Bennett, F. T. **Outlines of fungi and plant diseases: for students and practitioners of agriculture and horticulture.** *xi + 254 p.* Macmillan & Co.: London, 1924.

2300. Clute, Willard N. **Plant names and their meanings.—XXI. Orchidaceae.** Amer. Bot. 30: 145–153. 1924.

2301. East, E. M. **The Harvard Botanical Garden in Cuba.** Science 59: 433–434.

1924.—This station for tropical research has been recently enlarged and endowed and now offers opportunities for working in many different fields.—*C. J. Lyon.*

2302. Engler, Adolph, und Ernst Gilg. **Syllabus der Pflanzenfamilien. Eine Übersicht über die gesamte Pflanzensystem mit besonderer Berücksichtigung der Medizinal- und Nutzpflanzen nebst einer Übersicht uber die Florenreiche und Florengebiete der Erde zum Gebrauch bei Vorlesungen und Studien über spezielle und medizinisch- pharmazeutische Botanik.** Auflage 9–10. [**Syllabus of plant families. A summary of the entire plant system with special reference to medicinal and crop plants in addition to a resume of the floras and ecological formations of the earth, for use in lectures and studies relating to special and medico-pharmaceutical botany.**] *xlii + 420 p. 462 fig.* Gebrüder Borntraeger: Berlin, 1924.—The 8th edition having been long out of print, the authors in 1922 undertook the preparation of the present edition, retaining the original arrangement based on morphological progression, but with numerous additions including several smaller families whose genera could no longer be retained in the places hitherto assigned to them in larger families.—After discussing the principles of systematic arrangement and outlining the characteristic features of the older natural systems, the main body of the work takes up in order the following main groups with their subdivisions: Schizophyta; Phytosarcodina, Myxothallophyta, Myxomycetes; Flagellatae; Dinoflagellatae; Silicoflagellatae; Bacillariophyta; Conjugatae; Chlorophyceae; Charophyta; Phaeophyceae; Rhodophyceae; Eumycetes, including Phycomycetes, Ascomycetes, Protomycetes, Basidiomycetes, Fungi Imperfecti, and lichens; Embryophyta Asiphonogama including Bryophyta (Hepaticae, Musci) and Pteridophyta (Filicales, Articulatae, Lycopodiales, Psilotales, Isoetales); and Embryophyta Siphonogama, including Gymnospermae and Angiospermae.—An appendix gives a general review of the floras and ecological formations of the earth.—*Frederick V. Rand.*

2303. Fisher, O. S. **What proportion of the practices projected by the extension service are adopted by farmers?** Jour. Amer. Soc. Agron. **16**: 315–320. 1924.

2304. Forbes, Wm. T. M. **On botany on the campus.** Science **60**: 359. 1924.—As an aid in introducing elementary students of botany to plants as they grow, collections of native and introduced forms should be allowed to grow on the college campus.—*C. J. Lyon.*

2305. Gruenberg, Benjamin C. **Osmosis demonstrations for biology classes.** Science **60**: 359–360. 1924.—Directions are given for preparing and using celloidin bags. *C. J. Lyon.*

2306. Haskins, Charles Homer. **Studies in the history of mediaeval science.** (Harvard historical studies . . . vol. 27) *xiv + 411 p.* Harvard Univ. Press: Cambridge, 1924.

2307. Heald, F. B. **Some suggestions for teaching mycology.** Trans. Amer. Microsc. Soc. **41**: 175–178. *Fig. 1–2.* 1922.—Two methods of studying mycology are noted: (1) Use of artificial keys with the prime object of placing species in their respective pigeon-holes and (2) construction of diagrammatic keys expressive of natural relationships among the various groups. The 2nd method creates greater interest, develops reasoning powers, cultivates scientific imagination, aids in understanding evolution, and emphasizes the fact that classification is in reality an expression of relationships. This method is discussed and illustrated in some detail.—*Frederick V. Rand.*

2308. Иванов, Л. А. [Ivanov, L. A.] **Кжопросу о задачах фисиологии и екологии, растений.** [**Problems of plant physiology and ecology.**] Дневник Русского Ботанического Конгесс. [Jour. Russian Bot. Congress] **1**: 36. 1921.

2309. Johnson, Walter. **The nature world of London. 1: Trees and plants.** *viii + 118 p. 8 pl.* The Sheldon Press: London. The Macmillan Co.: New York & Toronto, 1924.

2310. Ramaley, Francis. **Laboratory manual of college botany.** *22 p.* Boulder, Colorado, 1924.

2311. Ransower, H. C. **What proportion of the facts published by the experiment station are usable in extension work.** Jour. Amer. Soc. Agron. **16**: 310–315. 1924.

2312. Sumner, R. H. **The comparative value of field demonstrations and other extension methods in agronomy.** Jour. Amer. Soc. Agron. **16**: 321–324. 1924.

2313. Trelease, William. **The relation of botany to agriculture.** Science 60: 89–94. 1924.—Agriculture needs botany and originated as practical applications of botanical knowledge. It has been asked if a course in botany is better for agricultural students than similar courses in zoology or biology. The fundamental nature of the subject matter of botany and the comparative simplicity of the processes of nutrition, reproduction, etc., seem to recommend the use of the botany course. The workers who have advanced plant industry have really been botanists and pure botany is behind all plant breeding, pathology, seed selection or other practices in agronomy.—The college course in botany should include an adequate treatment of morphology and physiology and should endeavor to acquaint the students with plants. This last phase is harder to accomplish and the student should begin that part of botany in high school or at home. The teacher of biology in the high school and the parent also should have the opportunity in their college courses of learning to know the familiar plants and animals.—*C. J. Lyon.*

2314. White, Orland E. **El Monte.** Brooklyn Botanic Gard. Leaflets 11^8. *4 p.* 1923. —This is a brief popular description of the forest of the Amazon valley.—*Charlotte S. Young.*

2315. Youngblood, B. **Texas Agricultural Experiment Station system.** Texas Agric. Exp. Sta. Circ. 33: *1–40.* 1924.—This circular explains the purpose, methods and types of service, and other questions concerning this institution.—*L. Pace.*

CYTOLOGY

Gilbert M. Smith, *Editor*

(See also in this issue Entries 2131, 2550, 2562, 2570, 2571, 2588, 2640, 2752, 2755, 2756, 2778, 2933, 3032)

2316. Anonymous. [Summary of the paper by: Ludford, Reginald J. **The cytology of growth.** (In: Proceedings of the Quekett Microscopical Club. Jour. Quekett Microsc. Club 2nd Ser. 15: 19–49)] *P. 24–26.* 1923.—A summary of the development of cytological study, of experiments with growing cells in nutritive media, and of experiments with cancer tissue is given.—*L. B. Walker.*

2317. Afzelius, K. **Embryosacentwicklung und chromosomenzahl bei einigen Platanthera-arten.** [Embryosac development and chromosome numbers in certain Platantheras.] Svensk. Bot. Tidskr. 16: 371–382. *Illus.* 1922.—A complete tetrad formation occurs in megaspore development. The chalazal cell becomes 2-nucleate and develops into the embryosac. In *Platanthera bifolia* and *P. chlorantha* the 3-micrypolar cells disintegrate at about this stage; in *P. obtusa* they often remain until the 4-nucleate stage. An 8-nucleate embryosac is developed, though in *P. chlorantha* and *P. obtusata* the last division in the micrypolar region sometimes fails to occur. Chromosome counts in the heterotypic division of the embryosac mother cell indicate that n = 21 for *P. bifolia* and *P. chlorantha*, while n = 63 for *P. obtusata*. In *P. obtusata* the embryosac development seems to occur more rapidly than in the other regions.—*Wm. Randolph Taylor.*

2318. Balls, W. L. **The growth structure of a cell-wall.** (Abstract) Rept. British Assoc. Adv. Sci. 1922: 397. 1923.

2319. Blackburn, K. B., and H. Harrison. **The meiotic phase in the Salicaceae.** (Abstract) Rept. British Assoc. Adv. Sci. 1922: 398. 1923.

2320. Carter, Nellie. **Cytology of the Cladophoraceae.** Ann. Bot. 33: 467–478. 1919. —In the genera *Chaetomorpha*, *Rhizoclonium* and *Cladophora*, the chloroplast was found to be a comparatively regular sheath lining the cell wall, lacking outgrowths on the external surface, and varying according to the age of the cell in extent of perforation as well as penetration into the lumen of the cell. In an older cell with a more reticulate chloroplast that forms a scanty net-work in the central region, colorless cytoplasm is found to occupy the interstices. The nuclei in *Cladophora* and *Chaetomorpha* are nearly always scattered through the chloroplast, occurring in close association with the pyrenoids. In *Cladophora* and *Rhizoclonium*, with the disappearance of the deeply staining karyosomes of the resting nucleus a

spireme is formed that splits into a number of chromosomes. Their division is followed by a constriction of the spindle in the equatorial region and the 2 daughter nuclei are reconstructed as the fibres gradually disappear.—*L. O. Gaiser.*

2321. Dangeard, Pierre. **Remarques sur l'état du cytoplasme observé "in vivo" dans l'albumen d'une graine de Ricin, à l'état de vie ralentie.** [Condition of the cytoplasm in the albumen of a castor bean seed in the dormant state observed in vivo.] Bull. Soc. Bot. France 70: 895–898. *Fig. 1.* 1923.—The stages in the disappearance of the cytoplasm in the ripening seed of *Ricinus* sp. are traced.—*P. A. Young.*

2322. Dangeard, Pierre. **Sur l'origine des vacuoles et de l'anthocyane dans les feuilles du Rosier.** [Origin of vacuoles and of anthocyanin in the Rose.] Bull. Soc. Bot. France 69: 112–118. *Fig. A–C.* 1922.—The article is a detailed and illustrated description of the processes mentioned in the title.—*P. A. Young.*

2323. Флеров, Б. К. [Flerov, B. K.] **К цитологии Ustilago Avenae Pers., по данным культуры in vitro.** [The cytology of Ustilago Avenae Pers. in cultures in vitro.] Труды секции по микологии и фитопатологии русского ботанического общества. [Trav. Sect. Myc. & Phytopath. Soc. Bot. Russie Trav. Div. Moscow] 1: 23–36. 1923.—The chlamydospores of *Ustilago Avenae* Pers. obtained in vitro, developed from uninucleate cells without fusion of nuclei. In vitro, this fungus has no true binuclear nature. Following growth in culture the fungus may be divided into 2 widely different races. The binuclear condition in *U. Avenae* is acquired in 2 ways: by fusion of 2 cells of the promycelium or of 2 conidia, and by simple division of the nucleus in one and the same conidium, as it germinates. (From author's French summary.)—*Frederick V. Rand.*

2324. Gross, J. [Rev. of: Franz Doflein. **Studien zur Naturgeschichte der Protozoan. VII. Untersuchungen über das Protoplasma und die Pseudopodien der Rhizopoden. (Cell and protoplasmic studies. VII. Researches on the protoplasm and pseudopodia of rhizopods.)** Zool. Jahrb. Anat. Ontogenie 39: 335–384. *Pl. 19–22, fig. A–J.* 1916.] Arch. Protistenk. 40: 109–110. 1919.

2325. Guilliermond, A. **Recherches sur l'évolution du chondriome pendant le développement du sac embryonnaire et des cellules mères des grains de pollen dans le Liliacées et sur la signification des formations ergastroplasmiques.** [Development of chondriosomes in the embryo sac and pollen mother-cells of the Liliaceae.] Ann. Sci. Nat. Bot. 10e. sér. 6: 1–52. *Pl. 1, 2. fig. 1–4.* 1924.—A sharp distinction is drawn between the plastids concerned in photosynthesis and other bodies not connected with this process. These maintain their separate individualities during development and are transmitted from cell to cell. Ergastroplasms ("formations ergastroplasmiques") in the cytoplasm of the embryo sac are interpreted as disorganizing chondriosomes. This study was based upon *Lilium* and *Tulipa.* —*Paul Weatherwax.*

2326. Harper, R. A. **The structure of protoplasm.** Amer. Jour. Bot. 6: 273–300. 1919. —"The cell theory with its varied implications lies at the center of all biological thought and interest" and its history has been "a continual vindication of the methods of observation and analysis as against the loose and easy methods of *a priori* speculation." After reviewing in some detail the outstanding contributions of cytology, of the chemistry of colloids, and of genetics to our current conceptions of protoplasm the author closes with the following statement: "The evidence is certainly clear that the polarity and the mass relations of the parts of the cell, chromosomes to nucleus, and nucleus to cytoplasm, are in some degree specific, as is also the tendency to return to the norm for these relations when they have been disturbed. The further development and refinement of these concepts is of much importance for our conceptions of cell organization and for the transition from the old viewpoint that protoplasm as a substance has a specific structure to the conception that the fundamental organization of living material is expressed in the structure of the cell.—The attempts to recognize plasmodia, coenocytes, syncytia, etc., as protoplasmic rather than cellular are, it seems to me, superficial and misleading. The old attempts to solve the problem of protoplasmic behavior by the assumption that it is composed of physiological units. . . .and the newer conception that its essential elements are unit factors, are, it seems to me, being merged in the conception that the structure of protoplasm is the structure of the cell as an organized

system and itself the unit in all the complex interactions by which the egg develops into the specialized and differentiated many-celled organism."—*Frederick V. Rand.*

2327. Hayden, Margaret Alger. **Karyosphere formation and synapsis in Phanaeus.** Thesis, Columbia Univ. *29 p.* Publ. by author: Wellesley, Massachusetts. 1924.—The author demonstrates the parasynaptic union of chromosomes associated with the formation of a karyosphere in *Phanaeus*. After the last spermatogonial telophase, 12 V-shaped leptotene threads are formed, with their apices imbedded in one plasmosome-like body and their distal ends in another. These threads undergo a conjugation probably of the parasynaptic type. The basichromatin of the pachytene chromosomes appears finally to enter into the formation of the karyosphere. With dissolution of the latter, 6 ring-shaped tetrads emerge, temporarily connected in a chain. Apparently the entire content of the karyosphere is used up in the formation of the chromosomes; no visible "plasmosome" is left.—It is intended that this paper will be republished later with the addition of the plates.—*Frederick V. Rand.*

2328. Keene, Mary Lucille [Mrs. E. T. Bartholomew]. **Studies of zygospore formation in Phycomyces nitens Kunze.** Trans. Wisconsin Acad. Sci., Arts & Letters **19**: 1195–1220. *Pl. 16–18.* 1919.—No morphological differences were found between germinating spores of plus and minus strains of *Phycomyces nitens*, but the vegetative mycelium of the plus strain grows somewhat more vigorously and the sporangia appear earlier. The 2 strains are necessary for zygospore formation, which, however, does not seem to be at all dependent upon concentration of the medium, but humidity appears to be an important secondary factor. The interlocking of lobes which occurs when certain hyphal branches of plus and minus strains come together appears to be the result of contact rather than of chemical stimulation. The progametes are developed through elongation of the terminal parts of these branches. As the progametes increase in size and round out from each other an increase in number of their nuclei is seen, due undoubtedly to nuclear divisions. Delimiting walls cut off the terminal parts, a resorption of the contiguous walls takes place, and the 2 gametes come in contact and fuse. Grouping of the nuclei follows, with 12 16 to a group. Nuclear fusions in pairs then reduce the number but increase the size of the nuclei. Deep-staining, crystal-like bodies found at all stages resemble the crystalloids and globoids of higher plants. At the time the 2nd wall investing the zygospore is laid down and with appearance of the oil masses, zonations are developed within the zygospore. Disorganization of some of the nuclei which follows results in the formation of irregular to globular masses taking stains deeply. Oil plastids enlarge, decrease in number and are then seen as definite, reticulate bodies. In the ripe zoospore there are 2 types of reserve material: a large amorphous mass, probably of nucleo-protein nature, and considerable oil. Typical nuclei are found, much reduced in number, in zygospores 6 months old; the protoplasm is now only a thin parietal layer.—*Frederick V. Rand.*

2329. Knight, Margery. **Nuclear changes in relation to different methods of reproduction in the Ectocarpaceae.** Rept. British Assoc. Adv. Sci. **1922**: 402. 1923.

2330. Kofoid, C. A., and O. Swezy. **Endamoeba dysenteriae in the lymph glands of man in Hodgkin's disease.** Univ. California Publ. Zool. **20**: 309–312. *4 fig.* 1922.—The criterion used in distinguishing amoebae which have wandered into the lymph glands is the morphology of the nucleus at mitosis and the number of chromosomes.—*Harold Kirby.*

2331. Kofoid, C. A., and O. Swezy. **Karyamoeba falcata, a new amoeba from the human intestinal tract.** Univ. California Publ. Zool. **26**: 221–242. *Pl. 23–24, 2 fig.* 1924.—There are 1–2 clear, blunt pseudopodia. The ectoplasm is sharply set off from the coarsely vacuolated endoplasm. "The nucleus contains one or two, rarely more, large, crescentic, siderophile masses, applied to the nuclear membrane and little peripheral chromatin otherwise applied to the membrane. There is a nearly spherical, eccentric karyosome in a halo adjacent to which a minute centriole is sometimes found. There is no concentric zoning of the intermediate region.—Mitosis proceeds by the emergence of polar caps, apparently from (?) the crescentic masses, the division of the centriole and the migration of the daughters to the poles over the outside of the polar cap on whose summit the centriole lies in the centre of a lighter halo. The centrioles are joined by a slender, thread-like, meridional intradesmose. Chromosomes emerge probably from peripheral chromatin as elon-

gated masses in the area between the polar caps. These shorten up into two rows in an end-to-end arrangement in the amphiaster stage. There are approximately twenty chromosomes. Mitosis is of the *Vahlkampfia* type."—*Harold Kirby.*

2332. Kofoid, C. A., and O. Swezy. **Mitosis in Endamoeba dysenteriae in the bone marrow in arthritis deformans.** Univ. California Publ. Zool. 20: 301–307. *7 fig.* 1922.—The identification of amoebae in the bone marrow rests on the type of mitosis. In rhizopod mitosis there is a persistent nuclear membrane, a meridional intradesmose, and probably 6 chromosomes. In somatic mitosis of the human cells there are 24 or 48 chromosomes, no persistent nuclear membrane, and no intradesmose.—*Harold Kirby.*

2333. Kofoid, C. A., and O. Swezy. **On the free, encysted and budding stages of Councilmania lafleuri, a parasitic amoeba of the human intestine.** Univ. California Publ. Zool. 20: 169–198. *Pl. 18–22, 3 fig.* 1921.—*Councilmania lafleuri* is a new species of human intestinal amoeba. The free stage is active and forms hyaline pseudopodia. There are many food vacuoles containing bacteria, red blood corpuscles, and other organic material. The nucleus has an eccentric karyosome with a clear narrow halo, a clear intermediate zone, and peripheral chromatin on the nuclear membrane. The cysts are formed in the bowel. They possess 8 or occassionally 16 nuclei formed by 3 or 4 divisions, a relatively large glycogen vacuole, and chromatoidal bodies which are involved in the metabolic process. The nuclei have little peripheral chromatin and large, eccentric or central, spheroidal, reniform or lobed karyosomes, which are often divided into scattered particles. In the mitotic phases it can be seen that there are 8 chromosomes and an intradesmose on the inner face of the nuclear membrane connecting the polar centrosomes of the spindle. The intradesmose is distinct from the paradesmose, which lies on the outer side of the nuclear membrane in flagellates. Distinctive features of *Councilmania* are budding and the escape of amoebulae, which may occur in the bowel.—*Harold Kirby.*

2334. Kofoid, C. A., and O. Swezy. **The cytology of Endamoeba gingivalis (Gros) Brumpt compared with that of E. dysenteriae with special reference to the determination of the amoebas in bone marrow in arthritis deformans of Ely's second type.** Univ. California Publ. Zool. 26: 165–198. *Pl. 14–18, 1 fig.* 1924.—*Endamoeba gingivalis* differs from *E. dysenteriae* in the smaller, less regular nucleus, irregularly distributed peripheral chromatin, smaller often subdivided karyosome, granular rather than clear karyosomal halo and clearer intermediate zone. The degree to which *E. gingivalis* invades tissues is still to be determined.—*Harold Kirby.*

2335. Litardière, R. de. **Sur l'insertion fusoriale des chromosomes somatiques. [The fusorial insertion of the somatic chromosomes.]** Bull. Soc. Bot. France 70: 193–197. *Fig. 1–3.* 1923.—The author gives results of work on *Crepis virens L.* and refers to work on the Filicineae and on *Galtonia candicans.*—*P. A. Young.*

2336. Longley, Albert E. **Cytological studies in the genus Crataegus.** Amer. Jour. Bot. 11: 295–317. *3 pl., 8 fig.* 1924.—The diploid chromosome number in this genus is 32. In an examination of nearly 100 species of *Crataegus*, 13 diploid species were found—*C. Collina C. punctata, C. Margaretta, C. mollis, C. Treleasei, C. sera, C. tomentosa, C. nitida, C. cuprea, C. Canbyi, C. Oxyacantha, C. monogyna* and *C. sanguinea microphylla;* and 57 triploid species —*C. cognata, C. fusca, C. delawarensis, C. pruinosa, C. pausiaca, C. vicina, C. assurgens, C. Eamesii, C. flabellata, C. exclusa, C. fluviatilis, C. Holmesiana, C. Hillii, C. Pringlei, C. sertata, C. lobulata, C. pedicillata, C. tardipes, C. Bealii, C. Boyntonii, C. dacroides, C. flavida, C. indicta, C. intricata, C. meticulosa, C. Bisselii, C. Buckleyi, C. Delosii, C. foetida, C. infera, C. modesta, C. Painteriana, C. pinetorum, C. padifolia, C. Sargentii, C. vericunda, C. pusilla, C. Stonei, C. Wheeleri, C. paucispina, C. tarda, C. pentandra, C. Brunetiana, C. Jackii, C. Dodgei, C. Arnoldiana, C. lanuginosa, C. diffusa, C. Crus-galli, C. Palmeri, C. rotunda, C. phlebodia, C. rivalis, C. asperifolia, C. Douglasii, C. coccinoides* and *C. Chapmanii;* and 6 tetraploid ones—*C. apposita, C. Bartoniana, C. Peckii, C. rotundifolia, C. rotundifolia* var. *pubera* and *C. Forbesae.*—Five species were found which were triploid or tetraploid, but in which the pollen was almost completely aborted—*C. pallens, C. pygmaea, C. Smithii, C. triflora* and *C. disperma.* The range of the diploid species is usually to the south, west and north of that occupied by the presumably heterozygous forms. The triploid and tetraploid

types show such features as pollen sterility, irregular chromosome distribution, polycary and polyspory. Those species among this group which are able to form pollen are probably heterozygous; those which do not form pollen seem to have resulted from crosses of distantly related species. Multiplication of species in this genus has apparently taken place by hybridization in the normal habitats.—*E. W. Sinnott.*

2337. Longley, Albert E. **Cytological studies in the genus Rubus.** Amer. Jour. Bot. **11:** 249–282. *5 pl., 13 fig.* 1924.—The haploid chromosome number in *Rubus* was found to be 7, and the members of the genus are grouped according to their observed chromosome numbers as follows: (1) Diploid,—*R. idaeus* var. *canadensis*, *R. subarcticus*, *R. occidentalis*, *R. illecebrosus*, *R. triphyllus*, *R. neglectus*, *R. idaeus* × *strigosus*, *R. occidentalis* × *idaeus* var. *aculeatissimus*, *R. occidentalis* × *strigosus*, *R. odoratus*, *R. alleghaniensis*, *R. frondosus*, *R. Randii*, *R. argutus*, *R. canadensis*, *R. pergratus* × *procumbens*, *R. canadensis* × *Baileyanus*, *R. recurvicaulis*, *R. villosus*, *R. argutus* and *R. setosus*.—(2) Triploid, *R. deliciosus*, *R. canadensis*, *R. setosus*, *R. nigricans* × *hispidus*, *R. sativus*, *R. alleghaniensis* × *Baileyanus*, *R. thyrsoideus*, *R. glandicaulis*, *R. alleghaniensis* × *setosus*, *R. alleghaniensis*, *R. nigricans* × *nigrobaccus*, *R. biformispinus*, *R. orarius*, *R. pergratus*, *R. alleghaniensis* × *canadensis*, *R. amnicolus*, *R. argutus*, *R. recurvans*, *R. frondosus*, *R. Andrewsianus*, *R. alleghaniensis* × *argutus*, *R. multiformis*, *R. Baileyanus* × *canadensis*, *R. canadensis* × *hispidus*, *R. nigricans* × *plicatifolius*, *R. peculiaris*, *R. nigricans* × *canadensis*, *R. tardatus*, *R. flagellaris* × *setosus*, and *R. nigricans*.—(3) Tetraploid,—*R. caesius* var. *turkestanicus*, and *R. corylifolius*.—(4) Pentaploid,—*R. plicatifolius*, *R. flagellaris* × *frondosus*, *R. nigricans* × *procumbens*, *R. villosus*, and *R. hispidus*.—(5) Hexaploid,—*R. arundelanus*, *R. frondosus*, *R. recurvans*, *R. Jeckylanus*, *R. argutus* × *frondosus*, *R. alleghaniensis* × *Baileyanus*, *R. recurvans*, *R. semierectus*, *R. nigricans* × *procumbens*, and *R. hispidus* × *plicatifolius*.—(6) A *hispidus*-like species was found to be octaploid.—The diploid species show regular pairing and distribution of chromosomes and are probably pure species. The polyploid types show striking irregularities in chromosome distribution and pollen formation, leading frequently to polycary, polyspory and a high degree of sterility, and are therefore believed to be hybrids. Multiplication of species in this genus has apparently taken place by hybridization in their natural habitat.—*E. W. Sinnott.*

2338. McDonald, J. D. **On Balantidium coli (Malmsten) and Balantidium suis (sp. nov.), with an account of their neuromotor apparatus.** Univ. California Publ. Zool. **20:** 243–300. *Pl. 27–28, 15 fig.* 1922.—*Balantidium coli* and *B. suis* are very generally found in pigs. *B. coli* is found also in man, and causes balantidiasis. A detailed comparison of the 2 forms is made. The entire body surface of these protozoans is covered with fine cilia, of which the adoral cilia are the longest. In *B. coli* there is an anterior cytostome; this is ventrally placed in *B. suis*. There is an elongated macro- and a small micronucleus. There is a distinct pellicle underneath which the basal granules lie in the ectoplasm, each being connected by a ciliary rootlet to a secondary enlargement. From the cytostome the oesophagus extends inward, and down it the adoral cilia continue in a spiral course. A well developed neuromotor system is present. "The motorium, lying within the ectoplasm near the cytostome, gives rise to a circumoesophageal fibre. In addition, there is a heavier fibre which connects it with the basal granules of the adoral cilia. The rootlets of the adoral cilia extend far into the endoplasm, usually well into the posterior third of the cell. Where they pass from ectoplasm into endoplasm each adoral ciliary rootlet bears an enlargement and from this arises a radial fibre which passes to the periphery, turns posteriorly, and disappears in the granular band of ectoplasm. In passing to the periphery these radial fibres connect with enlargements of the rootlets of the cilia of the apical cone."—*Harold Kirby.*

2339. Mann, Margaret Campbell. **Microsporogenesis of Ginkgo biloba with especial reference to the distribution of the plastids and to cell wall formation.** Univ. California Publ. Agric. Sci. **2:** 243–248. *1 pl.* 1924.—A mechanism of plastid distribution is found in *Ginkgo*. During the 1st anaphase the plastids move so as to form a ring between the 2 groups of chromosomes, retaining this position until after the 2nd division. In the late 2nd ana- or early telophase the ring pushes inward and breaks with the result that about $\frac{1}{4}$ of the ring of plas-

tids comes to surround the inner face of each of the 4 nuclei of the tetrad. Cell-wall formation follows by a combination of ingrowth and plate formation unusual in higher plants. Finally the plastids resume the original scattered distribution of the 1st prophase. The regular plastid distribution involves a regular distribution of the starch grains in relation to cell-wall formation and suggests that they form a reserve material used in wall formation. The method of plastid distribution found here is compared to that of the chondriosomes described by other authors. The movements of the plastids indicate the new direction taken by forces in the cell at the 1st spindle formation. The resulting cell currents and the enlargement of the nucleus set the plastids in motion. The barrel shaped 1st spindle would tend to hold them in ring formation until the 2 second spindles form. The distortion of the ring may result from the same forces that separated the chromosomes and the division into 4 groups may depend on lateral microspore wall-formation.—*J. W. Lesley.*

2340. Mascre, M. **Sur les "cellules à ferment" des Primula et sur la formation des pigments anthocyaniques. [The enzyme cells of Primula and the formation of anthocyanin pigments.]** Bull. Soc. Bot. France **69**: 325–330. 1922.—The author describes several microchemical tests in connection with the cytological study of enzym forming cells.—*P. A. Young.*

2341. Newton, W. C. F. **Somatic chromosomes.** (Abstract.) Rept. British Assoc. Adv. Sci. **1922**: 398. 1923.

2342. Piech, Kazimierz. **Zur Entwicklung der Pollenkörner bei Scirpus lacustris L. [Development of pollen grains in S. lacustre.]** Bull. Acad. Polonaise Sci. et. Let. Ser. B. **1924**: 113–123. *Pl. 4.* 1924.—In *Scirpus lacustris* only 1 pollen grain develops from a pollen mother cell. After the reduction division of the latter only 1 of the 4 nuclei develops, the other 3 being pushed aside into the narrow, inner end of the pollen mother cell. Neither cell plates nor cell walls are formed, separating the nuclei of the tetrad. The 3 degenerated nuclei are expelled completely from the cytoplasm and become encapsuled by a secondarily developed membrane thickening. On the inner side of this callus accumulation lies the intine. The impossibility of normal wall formation, due to the prismatic form of the pollen mother cell and also the much stronger nutrition of the outer nucleus, is thought to cause this pushing aside of 3 nuclei of the tetrad.—The primary pollen nucleus divides into a generative and a vegetative nucleus. Instead of a naked generative nucleus there occurs in many pollen grains a generative cell with its own cytoplasm. After the division of the generative nucleus, or of the generative cell, in the ripe pollen grain there are constantly only 2 naked sperm nuclei visible.—*Frederick V. Rand.*

2343. Pujiula, Jaime. **Datos citológicos sobre el meristemo radical de Vicia Faba L., y la profase de células ontogénicas. [Cytological data connected with the meristem of the radicle of the Vicia Faba L., and with the prophase of germinal cells.]** Brotéria Sér. Bot. **21**: 90–96. *Pl. 2.* 1924.—The author oulines the general phenomena of cell division and comments on their relation to heredity. The material studied (radicle of germinating beans) was fixed in the following mixture: 25 parts 40% formaldehyde, 5 parts 0.5% chromic acid, 2.5 parts crystallized acetic acid. Longitudinal sections of the radicles showed many stages of cell division, which the author describes and, in part, figures. Attention is drawn to the similarity of the phenomena to stages seen in the spermatozoa of cattle and in the human embryo. The author seems to draw no definite conclusions; he raises questions as to whether the karyokinetic figures are really "specific" and essentially related to sexual reproduction, and whether they may not be due to the chemical condition of the cell contents.—*E. B. Chamberlain.*

2344. Rees, C. W. **The neuromotor apparatus of Paramecium.** Univ. California Publ. Zool. **20**: 333–364. *Pl. 32–36, 5 fig.* 1922.—By staining with Mallory's triple connective tissue stain and Heidenhein's iron-alum haematoxylin it has been possible to demonstrate a fibrillar system in *Paramecium.* This is a generalized type of neuromotor system. It centers in a motorium at the anterior end of the cytostome. The motorium functions as a coordinating centre. The peripheral fibres are arranged in 2 whorls, one on the oral, the other on the aboral side. These fibres connect the basal granules, and converge to a meeting place, the motorium. Fibres from this run also to the membranelle zones in the cytopharynx. At the time of division dedifferentiation of the neuromotor system takes place. Coordination is interrupted when these fibres are cut.—*Harold Kirby.*

2345. Ruys, J. D. **On the formation of "Triad"—groups of chromosomes in the divisions of the nuclei of the endosperm in Mouriria anomala Pulle.** Koninklijke Akad. Van Wetenschappen Amsterdam. Proc. Sect. Sci. 27: 438–440. 1924.—In studying the development of the embryo-sac in *Mouriria anomala*, the author detected a metaphase of a dividing endosperm nucleus in which the chromosomes were distinctly arranged in sets of 3; 12 sets of 3 were counted, which agrees fairly well with the diploid number (24) of chromosomes in a nucellus-nucleus.—*Frederick V. Rand.*

2346. Speeth, Caroline. **Über Kernveränderungen bei Actinosphaerium in Hunger- und Encystierungskulturen.** [Nuclear changes in Actinosphaerium in starved and encysting cultures.] Arch. Protistenk. 40: 181–219. *Pl. 15–16, 5 fig.* 1919.—The observations on nuclear hypertrophy, hyperplasis, and degeneration, chromidia formation, diminution of the number of nuclei in encystment, and origin of the "spongy centrosome" from the nucleus, after the manner of chromidia, corroborate the observations and support the theories of Hertwig.—*Harold Kirby.*

2347. Taylor, William Randolph. **A morphological and cytological study of reproduction in the genus Acer.** Contrib. Bot. Lab. Univ. Pennsylvania. 5^2: 112–138. *Pl. 6–11.* 1920.—Pollen development in the maples studied was found to proceed much as described by Mottier. Haploid counts in *Acer negundo* gave 13; in *A. platanoides*, 11; in *A. saccharum*, 13; in *A. pseudo-platanus*, 26; in *A. saccharinum*, 26; and in *A. rubrum*, approximately 72, 54 and (megaspore mother cell) 36 chromosomes.—Somatic counts in the root-tips gave in *Acer platanoides*, 26; in *A. pseudo-platanus*, 52; in *A. saccharinum*, 52, with also isolated cells containing about twice that number; in *A. carpinifolium*, 52; and in *A. rubrum*, above 90. Data relating to the last named species seem to indicate the existence of a tetraploid form, and the intermediate counts apparently show the existence of hybrids with the normal diploid form.—In ovule development of *A. rubrum* a row of 3 potential megaspores results from the divisions of the mother cell. The chalazal one persists and gives rise to the embryosac which normally has 8 nuclei; the other 2 megaspores degenerate. The polar nuclei fuse before fertilization and the endosperm nucleus passes to the middle of the sac before dividing. The embryosac, especially in *A. platanoides*, greatly enlarges and many free endosperm nuclei arise, but no cell walls. Growth of the embryo does not follow that of the ovule cavity; at first it is delayed but later proceeds more rapidly, at length filling the cavity and often with accompanying crumpling of the cotyledons.—*Frederick V. Rand.*

ECOLOGY

Geo. D. Fuller, *Editor*

(See also in this issue Entries 2159, 2170, 2186, 2249, 2251, 2253, 2308, 2470, 2484, 2489, 2507, 2513, 2522, 2525, 2528, 2612, 2705, 2714, 2728, 2744, 2760, 2765, 2964, 2995, 3113)

GENERAL, FACTORS, MEASUREMENTS

2348. Anonymous. **New discovery in mosquito suppression.** Sci. Amer. 130: 336. 1924.—The presence of *Chara hispida* in the water is said to prevent the breeding of mosquitoes.—*Chas. H. Otis.*

2349. Алехин, В. В. [Alekhin, V. V.] **Растительность лугов р. Вороны.** [The vegetation of the Vorona Valley.] Журнал Московского Отделения Русского Ботанического Общества [Jour. Moscow Sect. Russian Bot. Soc.] 1: 28–57. 1922.—In the study of the valley flora, the author follows the method of "complexes," that is, the observation of the correlation of plant associations with changes in the contour of the country, which, for convenience, is divided into the 3 regions: high, central and low. Two principal series and 30 associations are distinguished. (1) Series B, or Beckman series in which the association Beckmann crucif. is most characteristic. (2) Series D, which is characterized by a soil high in humic acid with poor aeration. The vegetation can vary either (A) by the series B with its corresponding associations becoming transformed into series D, or conversely, through a mixed intermediate series: or (B) by the associations of each series becoming transformed on account of sedimentation.—*Ernst Artschwager.*

2350. Arenès, J. **Etude sur la zone halophile en Provence. Végétation des côtes basses.** [Study of the halophytic zone in Provence. Vegetation of the lower coast.] Bull. Soc. Bot. France 71: 93–116. *Pl. 10–13, fig. 1–2.* 1924.—The associations of the region are described, their species listed and they are characterized according to Raunkiaer's biological spectra. Therophytes dominate the shore associations, 34%, while next in importance come the hemicryptophytes with 28.5%. The associations of the sandy shores and dunes include the Salsoletum, Sporoboletum, Psammetum, Juniperetum and Pinetum. The helophytic associations are those dominated by *Salicornia, Dorycnium gracile* and *Sonchus maritimus* while the salt marsh have associations of *Statice virgata, Spartina versicolor* and *Suaeda maritima.* Zones of therophytes, hemicryptophytes, phanerophytes and salt marsh plants are distinguished and delimited.—*P. A. Young.*

2351. Atkins, W. R. G. **Some physical and chemical factors which affect plant distribution.** (Abstract) Rept. British Assoc. Adv. Sci. **1922**: 402. 1923.

2352. Boresch, K. [Rev. of: Geitler, Lothar. **Die mikrophyten-Biocoenose der Fontinalis-Bestände des Lunzer Untersees und ihre Abhängigkeit vom Licht.** (The submarine microphyte flora of Fontinalis-associations and its relation to light.) Internat. Rev. Ges. Hydrobiol. u. Hydrograph. **1922**: 683. 1922.] Arch. Protistenk. 47: 139. 1923.

2353. Britton, Elizabeth G. **A trip to El Yunque, Porto Rico.** Torreya 24: 83–86. 1924.—The author describes a trip to the Luquillo Range in north-eastern Porto Rico, with special reference to mosses and ferns observed.—*J. C. Nelson.*

2354. Bruner, W. E., and J. E. Weaver. **Size and structure of leaves of cereals in relation to climate. A study in crop ecology.** Univ. Studies Univ. Nebraska 23: 163–200. *7 fig.* 1923.—Varieties of wheat, barley and oats were grown under conditions varying from mesophytism to considerable xerophytism and during 2 seasons. Complete records of the environmental factors were obtained. A marked difference in the structure of the leaves was evident during the latter part of the season, brought about by the dry midsummer. The different cereals showed decided differences in structure, the chlorenchyma of the wheat and oats having numerous many-lobed cells. Wheat showed most variation in response to the different conditions, and oats, by far the least. Histological studies showed for plants grown under progressively xerophytic conditions, more stomata per unit area, thicker epidermal cell walls, smaller epidermal cells, less intercellular space, more compact chlorenchyma, fewer vascular bundles in the cross-section of the leaf and smaller size of leaf. The last character is due to the fact that the cells of the leaf are both fewer in number and smaller.—*Geo. D. Fuller.*

2355. Butcher, R. W. **The plankton of the River Wharfe.** [Yorkshire]. Naturalist **1924**: 175–180, 211–214. *1 fig.* 1924.—A study from samples taken at Harewood Bridge, during 1921–22, leads the writer to associate the diatom maximum with nitrate abundance rather than with temperature. Notes are given on all factors that are thought likely to influence periodicity.—*W. H. Burrell.*

2356. Buxton, P. A. **Animal life in deserts. A study of the fauna in relation to the environment.** *vii + 176 p. 43 fig.* Edward Arnold & Co.: London, 1923.—A chapter entitled "The floral environment" is devoted to a general consideration of desert vegetation. Chapters on climate and on soil and water courses contain a good analysis of factors that are quite as important for plant as for animal life. The water and temperature relations are both carefully considered. The chapter on the relations between animals and plants discusses the food dependence of the former and also instances the homes afforded the animals by certain plants. Thus, 2 woodpeckers are found most abundantly in the range of *Cereus giganteus* in whose stem they nest. The small elf owl is found exclusively in deserts where this cactus grows, using abandoned woodpecker's holes for its nests, and several other birds are less strictly dependent upon the cactus and the woodpeckers for the extension of their range.—*Geo. D. Fuller.*

2357. Chouard, Pierre. **Une remarque sur la flore halophile des sources mineralisees.** [Halophytic flora of a mineral region.] Bull. Soc. Bot. France 69: 470–471. 1922.—In this region where the soil is locally mainly calcium carbonate, the author found *Carex glauca* and *Sesleria caerulea* completely surrounded by acid habitats. He compares this to other similar regions.—*P. A. Young.*

2358. Eden, Thomas. **The edaphic factors accompanying the succession after burning on Harpenden Common.** Jour. Ecol. 12: 267–286. 1924.—A statistical method of ascertaining the frequency of a species is described and the results obtained by the application of this method show that upon the area studied there is a succession after burning of (1) *Rumex acetosella*, (2) *Holcus lanatus* and (3) *Agrostis* sp. Edaphic factors estimated by quantitative methods show that lime requirement and humus content exhibit a gradation accompanying the progress of the succession. The nature of acidity and its probable relation to succession, to the formation of humus and to burning are discussed.—*Geo. D. Fuller.*

2359. Flattely, F. W., and C. L. Walton. **The biology of the seashore; with introduction by J. Arthur Thompson.** *xiv + 336 p. 16 pl., 23 fig.* Sidgwick & Jackson, Ltd.: London, 1922.—The volume is mostly on the animal life of the seashore but chapters on the physiographic and other factors of the area are of equal interest to plant ecologists. Under the heading, "The shore and its plant and animal associations," the general character of the vegetation and its zonation are briefly discussed. A bibliography contains about 150 citations. —*Geo. D. Fuller.*

2360. F[yson], P. F. [Rev. of: Bruhl and Dutta. **Commentationes phytomorphologicae et phytophysiologicae—II. Eichornia.** Jour. Dept. Sci., Calcutta Univ. Bot. 5: 1–9. *Pl. 12–16.* 1923.] Jour. Indian Bot. Soc. 4: 30. 1924.—The reviewer suggests that the best time for mechanical clearing of *Eichornia speciosa* is during the cold season, when the vigor of the plant is lowest, and that some use must be found for the plant as an inducement for removal. —*Winfield Dudgeon.*

2361. Galtsoff, P. S. **Limnological observations in the upper Mississippi, 1921.** Bull. U. S. A. Bur. Fish. 39: 345–438. 1924.—The distribution of plankton both horizontally and vertically, and the volume of the same, from Minneapolis, Minnesota to Keokuk, Iowa are given. Both zoo- and phyto-plankton are considered. Comparisons are made between the river plankton and those of nearby lakes, and the conclusion is reached that the greater abundance is in the lakes. Relative abundance of various species is indicated.—*T. C. Frye.*

2362. Haig, H. deH. **Forests and fertility.** Discovery 4: 129–132. 1923.—This is a discussion of the floods, the erosion, the decreased humidity and the lowering of the water table due to deforestation.—*Geo. D. Fuller.*

2363. Harshberger, J. W. **The third international phytogeographic excursion.** Ecology 5: 287–289. 1924.—A short account of the meetings held in Switzerland and northern Italy in July and August, 1923, is given with ecological notes on some of the stations visited.— *T. J. Fitzpatrick.*

2364. Hubbs, Carl L. [Rev. of: Flattely, F. W., and C. L. Walton. **The biology of the seashore. With introduction by J. Arthur Thompson.** *xiv + 336 p. 16 pl., 23 fig.* Sidgwick & Jackson, Ltd.: London, 1922.] Ecology 5: 198–199. 1924.—"To the reviewer it appears that the authors have greatly overstressed the role of intertidal conditions in the origin of general adaptations, that is, in evolution. The attempted interpretation of the littoral area as the 'cradle in evolution' appears especially speculative, even fruitless, because not susceptible to demonstration. As an introduction to the general natural history of seashore animals, the work under review is the most satisfactory of any with which the writer is familiar." [See also Bot. Absts. 12, Entry 2988, and in this issue, Entry 2359.]— *T. J. Fitzpatrick.*

2365. Ising, E. H. **Botanical Notes.** South Australian Nat. 3: 49. 1922.—This mentions flowering of *Eucalyptus viminalis* Labill. and bark shedding of *E. rubida* H.A. and J.M.M.—*Wm. Randolph Taylor.*

2366. Ising, E. H. **Some summer plants.** South Australian Nat. 3: 23–24. 1921.— *Dipopodium punctatum* R.B.r and *Lobelia gibbosa* Labill. are discussed, especially with regard to the flowering period.—*Wm. Randolph Taylor.*

2367. Kemmerer, George, J. F. Bovard and W. R. Boorman. **Northwestern lakes of the United States: Biological and chemical studies with reference to possibilites in production of fish.** Bull. U. S. A. Bur. Fish. 39: 51–140. (Document 944) 1924.—This is a study of plankton in which the relative abundance of zooplankton receives most attention.—*T. C. Frye.*

2368. Molliard, M. **Lichens décorateurs d'églises. [Decorative lichens on churches.]** Bull. Soc. Bot. France 70: 236-237. 1923.—Different species of *Lecanora* are found on the different kinds of stone used in the construction of churches some of which were erected about 1650. The color effects are rather pleasing.—*P. A. Young.*

2369. Moore, Barrington. **Physiological requirements of Rocky Mountain trees.** Ecology 5: 298–302. 1924.—This is an extended review of the work of Bates (see Bot. Absts. 13, Entry 3362) and others on the limiting factors for various species of conifers. The principal paper is criticised for its organization but commended for its thoughtful discussion of the problems involved.—*T. J. Fitzpatrick.*

2370. Moore, Barrington, Herbert M. Richards, H. A. Gleason, and A. B. Stout. **Hemlock and its environment. I. Field records.** Bull. New York. Bot. Gard. 12: 325–350. 1924.—This is a report of a portion of a series of investigations undertaken in order to determine the conditions under which *Tsuga canadensis* grows. In stands of the tree at New York Botanic Gardens, at Ithaca, New York, New Haven, Connecticut, and in the Adirondack Mountains, New York, during the summer of 1923, observations were made covering evaporation (black and white atmometers), solar radiation, precipitation and air and soil temperatures. Similar records were made in stands of adjacent broad leaved forests. The results have been plotted and show a close similarity of conditions in the various Tsuga forests, particularly with respect to evaporation. The different hemlock sites differ from one another less than do the hemlock and hardwood sites.—*Geo. D. Fuller.*

2371. Ostenfeld, C. H. **The vegetation of the north coast of Greenland based upon the late Dr. Th. Wulff's collections and observations.** Meddel. Grønland 64: 223–268. *Pl. 1–5, 5 fig.* 1923.—There is an annotated list of 70 spp. collected north of 82°N. Lat., most of which have very wide distribution. Only 3 species are confined to Greenland, namely, *Melandrium triflorum, Taraxacum arctogenum* and *Braya Thorild-Wulffii.* The growing period is limited to little more than 1 month since not until July is the mean temperature above freezing. The recorded mean for July is 2.65°C., with 10.8°C. the highest air temperature, although 24°C. was reached in tufts of vegetation. The air conditions seem favorable, as more than half the records indicate calm. The soil varies from rock to clay, being mostly gravel underlaid with clay. All plants are perennial with limited powers of vegetative multiplication; about 31% are chamaephytes, 59% hemi-cryptophytes and 10% cryptophytes. Fell-field (Fjaeldmark) is the prevalent type of vegetation. Only in the most favorable spots do continuous mats of flowerng plants, mosses and lichens occur. The largest plant is *Salix arctica*, reaching a maximum thickness of 2 cm. and showing 50 annual rings.—*Geo. D. Fuller.*

2372. Reed, G., and A. B. Klugh. **Correlation between hydrogen ion concentration and biota of granite and limestone pools.** Ecology 5: 272–275. 1924.—Near Kingston, Ontario, there is a contact between Algoma granite and Pamelia limestone. Of two neighboring pools, the one in the granite area has acidic water, the other in the limestone area has basic water. The pH in the granite pool ranged from 6.2 to 6.8 and in the limestone pool from 7.6 to 9.2. Each pool has a distinctive biota consisting of algae, protozoa, and entomostraca. The nature of the biota in both pools differed in October, 1921, and October, 1922, but the biota in the basic and acidic habitats remained strongly contrasted.—*T. J. Fitzpatrick*

2373. Scourfield, D. J. **Physical factors in fresh water biological problems.** Jour. Queckett Microsc. Club. 2nd Ser. 15: 1–18. 1923.—The topic is discussed under 3 headings, (1) physical properties of inorganic environment of the organism, (2) physical characteristics of the organisms themselves, and (3) physical principles and physical apparatus made use of in the collection and observation of the organism. Under (1), stress is placed upon the significance of the fact that the maximum density of water is at 4°C. which results in the turn over of water in lakes, upon the changes in viscosity of water at varying temperatures as related to the sustaining power of water and to locomotor organs, upon the incompressibility of water allowing organisms to sink to the bottom without injury, upon light penetration, and upon surface tension. Under (2), the size relationships such as relation between bulk and area, shape, physical nature of body substances and external coverings, specific gravity, position of center of gravity and the physical factors involved in movement are discussed. Under (3), the author especially urges the use of the centrifuge in collecting small net-passers

which yield 5 times as much organic matter in a year as plankton caught by a net and the use of the stroboscope for obtaining information as to the real life movements of organisms. —*L. B. Walker.*

2374. Seward, A. C. **Outposts of vegetation.** Nature 113: 823–825. *3 fig.* 1924.—Reference is made to reports in "Meddelelser om Grønland," (see this issue, Entry 2371.) Dr. Thorild Wulff collected 70 species of vascular plants, all perennials, on the 2nd Thule expedition (1916–18) on the north coast of Greenland. Only 10 species were previously known north of lat. 82°. This article mentions many of the species and describes conditions under which they grow. The figures reproduced are of *Saxifraga flagellaris*, *Herpestis Pallasii*, *Taraxacum phymatocarpum* and *Potentilla Pedersenii*.—*O. A. Stevens.*

2375. Sjostedt, L. Gunnar. **Nagra synpunkter till fragan om Sargassohavstangens ursprung och biologie. [The origin and biology of the Sargasso weed.]** Bot. Notiser 1924: 1–16. 1924.—The Sargasso Sea does not represent a distinct phenomenon, but is compared with other migratory associations of algae. The Sargasso weed is not a pelagic species, but a biological form, consisting of several species torn loose from the coast. The writer demonstrates connections between pelagic and attached forms, in *Sargassum vulgare* with broad leaved and small-leaved forms, *S. Hystrix* approaching var. *buxifolia*, and *S. Filipendula*. These 3 species, but especially *S. vulgare*, make up the main part of the floating Sargasso weed. The Sargasso plants, torn loose, may retain holdfasts and receptacles for a time, but later lose portions of the thallus, and otherwise acquire a form differing from the original. Sexual and vegetative reproduction are then impossible; however, newly loosened individuals occasionally show non-functioning reproductive cells. Winge sees the annual periodicity of the Sargasso weed as the result of stimulated growth under high summer temperature. Vegetative growth is not found in the genus *Sargassum* during the summer. In summer the Sargasso Sea acquires enormous contributions of loosened Sargassum individuals. It is this annual Sargassum drift from the coast of Central America and the West Indies that explains the origin and periodicity of the Sargasso weed.—*H. K. Svenson.*

2376. Sterner, Rikard. **Floran på orthocerkalken vid Humlenäs i Kridala socken i Kalmar Län. [The flora on the orthoceran limestone at Humlenäs, in Krisdala Parish, Province of Kalmar, eastern Sweden.]** Bot. Notiser 1921: 269–281. 1921.—The author recognizes as the chief habitats (1) hardwood forests; (2) gravel slopes and limestone rocks; (3) fields and fence-rows; (4) ditches, banks and meadows; and (5) limestone rock with a moss flora. He lists the species for these habitats. The great lime content of the ground water and the rather limited precipitation seem to have made the flora xerophytic and poor in species and many calcicoles are listed as being absent. The finding of *Cornus sanguinea* and *Mollia inclinata* is recorded and several cases of local distribution are discussed in detail.—*P. A. Rydberg.*

2377. Stevens, O. A. **Meeting summer across the prairie.** Amer. Bot. 30: 140–144, 1924.—This is a report on the plants seen in bloom June 17, 1924, as observed from a train during a daylight journey from Willmar, Minnesota on the north, to Blue Rapids, Kansas, on the south, with observations on blooming periods.—*Susan P. Nichols.*

2378. Summerhayes, V. S., L. W. Cole, and P. H. Williams. **Studies on the ecology of the English heaths. I. The vegetation of the unfelled portion of Oxshott Heath and Esher Common, Surrey.** Jour. Ecol. 12: 287–306. *1 pl., 1 fig.* 1924.—The area under consideration has an annual rainfall of 62 cm. and seems originally to have been entirely heathland. Several plant communities are now to be recognized, dominated respectively by (1) *Calluna vulgaris*, (2) *Pteridium aquilinum*, (3) grasses, (4) *Ulex europeus* and *Rubus fruticosus*, (5) *Molinia caerulea* and (6) *Calluna*, *Molinia* and *Erica tetralix*. These communities are described and their constituent species listed. These communities are in places being colonized by trees and giving rise to (1) a coniferous wood of *Pinus silvestris* and (2) a mixed deciduous forest of *Betula*, *Quercus robur* and *Fagus silvatica*. Lists of animals in some of the communities are given.—*Geo. D. Fuller.*

2379. Tadgell, A. J. **Mount Bogong and its flora.** Victoria Nat. 41: 56–80. *Map.* 1924.—This paper includes notes on the topography of the area, previous explorations, general natural history features, and a list of plants above 4000 feet, with their altitude range and the collectors responsible.—*Wm. Randolph Taylor.*

2380. Wall, A. **The Southern Alps.** *15 p.* The Lyttelton Times Co.: Christchurch, New Zealand. [1923.]—This is a popular account of a botanical expedition to the Franz Josef Glacier and Mount Cook, New Zealand.—*H. H. Allan.*

2381. Watt, A. S. **On the ecology of British beechwoods with special reference to their regeneration. II. The development and structure of beech communities on the Sussex Downs.** Jour. Ecol. 12: 145–204. *6 fig.* 1924.—The forest of beech, *Fagus silvatica*, here studied in detail, is upon a loam over chalk soil whose pH is 5.5 to 7.8 in a region with an annual precipitation of 32-36 inches. The stages leading up to the beech forest are found to be successively scrub, ash-oak, and beech. Of these the pre-climax stages are described in detail. The factors which may influence the competition between ash, oak, and beech are examined and deeper loam seems to favor the 2 first but there seems to be no definite evidence that the deeper loams are limiting to beech. The results of the investigation seem to show that the forests studied are to be explained as the result of the natural process of invasion, ecesis and competition and are but little disturbed by human activity.—*Geo. D. Fuller.*

2382. Weaver, J. E. **Plant production as a measure of environment. A study in crop ecology.** Jour. Ecol. 12: 205–237. *Pl. 1–5, 14 fig.* 1924.—These studies were made in true prairie (*Stipa-Koeleria*) at Lincoln, Nebraska, in mixed prairie (*Stipa-Bouteloua*) in north central Kansas, and in the short grass plains (*Bulbilis-Bouteloua*) at Burlington in eastern Colorado. At each station all the important aerial and edaphic ecological factors such as rainfall, water and nutrient content of soil, humidity, evaporating power of the air, soil and air temperature, and wind movement were measured and compared during 3 growing seasons. Plant production of native grasses and the smaller cereal crops was determined by the employment of a large number of cut meter quadrats. The relative production of certain legumes and of maize was also determined. It was early determined that the water relations of soil and air were controlling, other factors being merely contributory. The yield of pure stands of short-grass (*Bulbilis dactyloides* and *Bouteloua gracilis*), wheat grass (*Agropyrum glaucum*), mixed short- and tall-grasses, and mixed tall-grasses was found to decrease from the true prairie through mixed prairie to short-grass plains directly in proportion to available water-content of soil and inversely proportional to the evaporating power of the air. The same relation was determined not only for the smaller cereals (oats, wheat and barley) but also for alfalfa and sweet clover as well as for maize. The plant yield at each station during different seasons also correlated well with the variations in the water relations. Since deficiencies in water-content were most marked late in summer, the differences in plant production were often greatest in late maturing tall-grasses at the eastern stations. Thus, native and crop plants are shown to integrate environmental conditions and to express them quantitatively in yield.—*Author.*

2383. Weiss, H. B., and Erdman West. **Insects and plants of a dry woods in the pine barrens of New Jersey.** Ecology 5: 241–253. *3 fig.* 1924.—The article treats mainly of the fauna of the region, but sections are given to the structure of the woods and the vegetation of the open area. Two-thirds of the trees are *Pinus rigida*, the others comprise *Quercus stellata*, *Q. Marilandica*, and *Q. prinus*, with a few *Pinus echinata* and *Sassafras varifolium*. The dominant shrub is *Quercus ilicifolia*, along with *Q. prinoides*. Other shrubs are *Gaylussacia frondosa*, *Vaccinium vacillans*, *Myrica asplenifolia*, *M. carolinensis*, *Arctostaphylos Uva-ursi*, *Rhus copallina*, associated with *Tephrosia virginica*. In the open areas the vegetation is low in stature and of 2 groups—the woody shrubs and the softer herbaceous plants. The most conspicuous shrub is *Prunus maritima*, others are *Vaccinium vacillans* and *Arctostaphylos Uva-ursi*, all of which occur in pure stands over considerable ground.—*T. J. Fitzpatrick.*

STRUCTURE, BEHAVIOR, SYMBIOSIS

2384. Blaringhem, Louis. **Sur les chimères du Cytisus Adami. [The chimeras of Cytisus Adami.]** Bull. Soc. Bot. France 70: 401–409. *1 pl.* 1923.

2385. Buchner, Paul. **Studien an intracellularen Symbionten. III. Die symbiose der Anobiinen mit Hefepilzen. [Studies on intracellular symbionts. III. The symbiosis of Anobiinae with yeasts.]** Arch. Protistenk. 42: 319–336. *Pl. 14, 4 fig.* 1921.—It has been known

for a long time that *Anobium paniceum*, a small grain beetle, supports microorganisms in a part of its intestinal epithelium. They have been regarded as symbionts, and are found to be yeasts capable of cultivation in artificial media. In the midgut of the larva are found pocketings of the epithelium, and in these cells are the symbionts. The cells supporting masses of yeasts are large and swollen; the nuclei are deformed. The same pockets are found in the midgut of the imago. These yeast-bearing cells are called "mycetocytes." The fungi are typical yeasts, often pyriform or oval, with a characteristic big vacuole, and they show budding.—*Harold Kirby.*

2386. Buchner, Paul. **Tier und Pflanzen in intracellularer Symbiose. [Intracellular symbiosis of animals and plants.]** *462 p. 2 pl., 103 fig.*, Gebrüder Borntraeger: Berlin, 1921.—The 1st 3 parts of the book constitute a review of the literature dealing with zoochorella, zooxanthella and symbiotic bacteria, the scattered citations being brought together in compact and systematic form. The 4th part, in which the author's own work is presented, deals with the intracellular symbiosis of insects. A section is devoted to the remarkable methods of transfer of the symbionts from the parents to the offspring. The meaning of intracellular symbiosis and the function of the symbionts are discussed. The 5th part of the book deals with symbionts in relation to luminescence in animals and the 6th part with the mistakes of previous investigators. At the end are 19 pages of bibliography, containing practically everything that has appeared up to 1921. (See also this issue, Entry 2393.)—*Peter Okkelberg.*

2387. Churchill, Jr., E. P., and S. I. Lewis. **Food and feeding in fresh-water mussels.** Bull. U. S. A. Bur. Fish. **39**: 437–471. 1924.—Food of both young and old consists of microscopic plants and animals, and detritus from their decay. Red Euglenae were definitely observed partly digested, but much matter was ingested and not digested.—*T. C. Frye.*

2388. Conard, H. S. **Belt transect of Cold Spring Harbor sandspit [Long Island, N. Y.].** 1922. Ecology **5**: 259–261. *1 fig.* 1924.—A transect was made in July, 1922, and compared with one made in 1909. The vegetation on the 2 transects corresponds exactly. A grove of *Ailanthus glandulosa* has extended from 14 × 8 feet to 40 × 12 feet, with outliers up to 500 feet. This introduces a new type of succession in this beach vegetation.—*T. J. Fitzpatrick.*

2389. Goldsmith, G. W. **Some field instruments and their application.** Univ. Studies Univ. Nebraska **23**: 201–264. *7 fig.* 1923.—Among the instruments described and figured are a psychrometer for field use in which a current of air is driven by a fan over a wet-bulb and a dry-bulb thermometer, a wood hygrometer, a soil sampler and a soil aerometer. Descriptions of the manner of using these instruments in the field are given and also a bibliography of the literature.—*Geo. D. Fuller.*

2390. Heim, Roger. **Note sur les zones de végétation fongique dans les Alpes. [Zones in the fungous vegetation of the Alps.]** Bull. Soc. Bot. France **69**: 464–469. 1922.—The author concludes that the forest fungous flora is little affected by the altitude, that of the alpine grass prairies is stunted but recognizable, and the fungi above this level are dwarfed and occur chiefly on mosses.—*P. A. Young.*

2391. Lutz, Frank E. **The color of flowers and the vision of insects, with special reference to ultraviolet.** Ann. New York Acad. Sci. **29**: 233–283. *Pl. 3–9, fig. 24–48.* 1924.—Photographs, taken through color filters, of a large number of flowers, both cultivated and wild, show that "white flowers rarely reflect more than a small proportion of ultraviolet; that yellow flowers show a distinct reflection of ultraviolet more often than not; and that when different flowers or parts of the same flower, though identical in color visually, are quite different photographically the result is usually due to ultraviolet reflection, but that a differental reflection of blue is sometimes at least slightly involved." The many varieties of most cultivated flowers show little difference in ultraviolet reflection in spite of great variation in visible color. Exception is found in the nasturtium (*Tropaeolum*), rose (*Rosa*), and sunflower (*Helianthus*). Experiments on the vision of insects showed that most of the flower-visiting insects reacted in a definite selective manner toward ultra-violet when choice was given between this and other light, and that they do not see red to green as well as blue to ultra-violet. Sight, however, is not considered to play nearly so important a role as smell. Color is considered to be the incidental product of the metabolism of the plant and to be only

of minor service to insects in finding flowers. Observations indicate that insects visit flowers from a down-wind direction only.—*Ray C. Friesner.*

2392. Melin, Elias. **Till kännedomen om mykorrhizasvamparnas spridningssätthos Ericaceerna. [Distribution of the mycorhiza-fungi on the Ericaceae.]** Bot. Notiser 1921: 283–286. 1921.—The mycorhizal fungi of *Calluna vulgaris*, according to Rayner, are distributed with the seed. At germination the hyphae immediately infest the protruding hypocotyl and root, and penetrate the tissues of the plant up to the ovary but do not enter the seed. The present author thought the conclusion that this method extends to the other Ericaceae was unsatisfactory and began experiments on *Azalea mollis*, making cultures on agar-agar at 20°C. From the resulting development of *Hormodendrum Hordi* and *Penicillium* spp., he concluded that the mycorhizal fungi are not found in the aerial parts of *Azalea mollis.—P. A. Rydberg.*

2393. Okkelberg, Peter. [Rev. of: Buchner, Paul. **Tier und Pflanzen in intracellularer Symbiose. (Intracellular symbiosis in animals and plants.)** *462 p. 2 pl., 103 fig.*, Gebrüder Borntraeger: Berlin, 1921 (see this issue, Entry 2386).] Ecology 5: 302–304. 1924.—"The book is inspiring and instructive and must remain a classic in years to come for those interested in the subject of intracellular symbiosis."—*T. J. Fitzpatrick.*

2394. Wilson, J. K. **Bacterial symbiosis in plants other than the legumes.** Jour. Amer. Soc. Agron. 16: 373–381. 1924.—Bacteria may be found in the tissues, buds, flowers and seed of a great number of plants. In certain cases bacteria found in the seed may pass through the tissues of the growing plantlet, subsequently appear in the leaves and blossoms and finally enter and remain with the growing seed. Hereditary symbiosis has been observed in 2 families and is suggested in many others. Plants belonging to the Myrsinaceae and Rubiaceae grow poorly and show nitrogen starvation when deprived of their bacterial symbiont.—*F. M. Schertz.*

VEGETATION

2395. Ewing, J. **Plant succession of the brush-prairie in north-western Minnesota.** Jour. Ecol. 12: 238–266. *5 fig.* 1924.—This is a transitional belt between the deciduous forests and the true prairie developed on flats left by the recession of glacial Lake Agassiz. The succession is hydrarch and may lead to either grassland or forest. In the former case the stages consist of associes of (1) *Poa-Agrostis*, (2) *Koeleria cristata* and (3) *Sporobolus-Andropogon.* In the latter the stages are usually dominated by (1) *Salix discolor*, (2) *Populus tremuloides* (or *P. balsamifera*) and (3) *Prunus virginiana*, the last being often replaced by (4) *Quercus macrocarpa.* If not interfered with by burning or lumbering, much if not all, of the brush-prairie would develop into a mesophytic deciduous forest similar to that of the belt to the east.—*Geo. D. Fuller.*

2396. Gaume, R. **Les associations végétales de la forêt de Preuilly (Indar-et-Loire). [Plant associations of the forests of Preuilly, France.]** Bull. Soc. Bot. France 71: 58–74, 158–171. 1924.—After describing the topography and soils, the associations characterized by the following plants are described and their constituent species listed: *Myriophyllum verticillatum, Scirpus lacustris, Heleocharis palustris, Carex stricta, Bidens tripartius, Schoenus nigricans, Molinia caerulea, Rhamnus Frangula, Alnus glutinosa, Quercus sessiliflora, Erica Tetralix, Ulex nanus, Agrostis canina, Cicendia filiformis*, and *Scleranthus annuus.—P. A. Young.*

2397. Seifriz, William. **The altitudinal distribution of lichens and mosses on Mt. Gedeh, Java.** Jour. Ecol. 12: 307–313. *1 pl.* 1924.—The slopes studied, 4,600–9,400 feet, are divided into 5 subzones which are described and lists of species given for each. They are: (1) 4,600–5,500 feet characterized by giant trees of *Altingia excelsa* with rich lichen and poor moss flora; (2) up to 7,000 feet characterized by *Podocarpus imbricatus* with abundant loose pendent mosses and few lichens; (3) 7,000–8,000 feet with an open forest, a prolific herbaceous growth and few lichens or mosses; (4) 8,000–9,200 feet, a foggy wind-swept zone, with small gnarled trees, largely *Vaccinium* spp. and an abundance of tufted mosses in the lower half and very few lichens, while in the upper half abundant lichens almost exclude mosses. Above 9,400 feet is an old lava floor having very few lichens or mosses. Most of the species

are limited to 1 subzone, the factor of control being conditions of moisture, particularly for the mosses. In the lower rich forests insufficient illumination and competing mosses reduce the lichen development.—*Geo. D. Fuller.*

2398. Seward, A. C. **Impressions of Greenland's plant life.** Discovery 3: 227–230. *3 fig.* 1922.—A non-technical description is here given of the vegetation of West Greenland. —*Geo. D. Fuller.*

2399. White, C. T. **Flora of Moreton Island.** Queensland Nat. 4: 86–92. 1924.—A short history of the botanical exploration of the island is given. The vegetation is arranged into the associations of the beach, brackish-swamp, fresh-swamp, peat-swamp, and open forest. The more interesting members of these associations are remarked upon. A list of introduced plants is included.—*W. D. Francis.*

FLORISTICS

2400. Anonymous. **Sandhill plants.** South Australian Nat. 5: 117–119. 1924.—Special mention is made of *Alyxia* sp. and of *Spinifex hirsuitus.*—*Wm. Randolph Taylor.*

2401. Allorge, Pierre. **Le Fontinalis Duriaei Schimp. dans les Hautes-Alpes. [F. Duriaei in the high Alps.]** Bull. Soc. Bot. France 70: 254–255. 1923.

2402. Allorge, P., et M. Denis. **Une excursion phytosociologique aux lacs de Biscarrosse (Landes).** [A phytosociological excursion to the lakes of Biscarrosse (Landes).] Bull. Soc. Bot. France 70: 693–717. *Pl. 10–13, fig. 1–3.* 1923.—This detailed article lists the different species of plants found in the different habitats. Figs. 1 and 2 show ecological cross-sections of 2 regions.—*P. A. Young.*

2403. Arbost, J. **Le Châtaignier dans les Alpes-Maritimes. [The chestnut in the maritime Alps.]** Bull. Soc. Bot. France 69: 236. 1922.

2404. Arènes, J. **Étude sur la végétation des vallées en Provence. [Study of the vegetation of the Provence valleys.]** Bull Soc. Bot. France 69: 490–507, 725–740, 818–831. *4 fig.* 1922.—In this ecological study, the author lists the species occurring in the different habitats. —*P. A. Young.*

2405. Arènes, J. **Étude sur la zone halophile en Provence. Végétation des falaises. [Study of the halophytic zone in Provence. Vegetaion of the cliffs.]** Bull. Soc. Bot. France 70: 238–247. 1923.—Lists of plants arranged according to slope exposure and zonation are given for the Mediterranean rock habitats.—*P. A. Young.*

2406. Blomgren, N. **Fynd of adventiveväxter vid Kalmar åren 1915–1921. [Finds of adventive plants at Kalmar, eastern Sweden, in the years 1915–1921.]** Bot. Notiser 1922: 77–80. 1922.—The ballast-flora at Tjärhovet described by S. G. Blomquist in 1917, had almost disappeared, except *Diplotaxis tenuifolia, Hordeum murinum, Sisymbrium altissimum* and *Plantago ramosa.* A French steamer from Bordeaux unloaded ballast in 1921, giving origin to 10 new plants. A list of 16 adventive plants at the place is also given. At Barlastholmen, 12 such plants are noted, in the vicinity of Fredriksskans, 21; on the island Ängö, 14; and in the factory district near Kalmar West station, 8 such plants.—*P. A. Rydberg.*

2407. Bouly de Lesdain, M. **Ecologie d'une aulnaie dans les Moëres (Nord). [Ecology of an alder thicket in the north Moëres.]** Bull. Soc. Bot. France 71: 3–25. 1924.—The author describes the history of the region and lists the species of plants collected in the different habitats. He describes the new Discomycetes: *Bacidia subsaxicola* B. de Lesd. n. sp. and *Lecidea coarctata* var. *ornata* (Sommerf.) n. f. *sorediosa* B. de Lesd. He gives a description of *Rubus integribasioides* B. de Lesd. n. sp. (*R. integribasis* × *Caesius*). He describes the 2 new lichens: *Parmelia subaurifera* n. var. *fuliginoides* B. de Lesd. and *Gyalecta* (*Secoliga*) *alnicola* B. de Lesd. n. sp. He collected 121 phanerogams, 5 vascular cryptogams, 70 lichens, 41 mosses, 3 hepatics, and 63 fungi.—*P. A. Young.*

2408. Brun, P. le. **L'herborisation au col de la Traversette. [The botanizing trip to the neck of the Traversette.]** Bull. Soc. Bot. France 69: 481–489. 1922.—This article consists of lists of the plants found in the different habitats.—*P. A. Young.*

2409. Chevalier, Auguste. **L'origine géographique et les migrations des Bruyères. [The geographic origin and migration of the heaths.]** Bull.Soc. Bot. France 70: 855–870. 1923. —The true heaths or Ericoideae comprise 750 spp. Of these, 17 are found in Europe, 700

in South Africa, some 50 on the mountains of tropical Africa and 6 or 8 in north Africa. The mountains of tropical Africa are regarded as the center from which this group has migrated. —*P. A. Young.*

2410. Chevalier, Aug[uste]. **Rapports entre la végétation de la Normandie et du Massif Breton et celle de la Grande-Bretange.** [Relationship of the flora of Breton and Normandy with that of Great Britain.] Bull. Soc. Bot. France 70: 598–623. 1923.—An analysis of the flora of these countries leads to the conclusion that the English Channel has prevented certain continental elements from reaching Great Britain and correspondingly some Atlantic species have never reached France. Extensive lists of species with different affinities are given.—*Geo. D. Fuller.*

2411. Cleland, J. B. **The geographical distribution of South Australian plants.** South Australian Nat. 4: 122–124. 1923.—A plan for a concerted survey is outlined.—*Wm. Randolph Taylor.*

2412. Davy de Virville, Ad. **Note sur le dispersion du Daphne Cneorum L. dans le Sud-Ouest de la France.** [The dispersion of D. Cneorum in the south east of France.] Bull. Soc. Bot. France 69: 210–213. 1922.

2413. Erdtman, Gunnar. **Floristiska anteckningar från sydberg och sessiliflorieta i Nordhalland and Mark.** [Floristic notes on "south mountains" and forests of Quercus sessiliflora in North Halland and Mark counties, Westergötland, Sweden.] Bot. Notiser 1922: 81–89. 1922.—These forests, found on mountain knobs and mountain slopes in Westergötland, are to be regarded as remnants of a magnificent oak forest which reached its maximum extension 1,000–1,300 years ago. The oak-woods have been decimated by lumbering and invaded by spruce. The undergrowth, once luxuriant, is now very sparse. Lists of secondary species are given and they are shown to contain more western than eastern forms. Some species are in danger of extermination from advancing cultivation.—*P. A. Rydberg.*

2414. Gerbault, M. **Sur la naturalisation de l'Erigeron mucronatus DC. sur plusieurs points de l'Europe occidentale.** [The naturalization of E. mucronatus in several places in western Europe.] Bull. Soc. Bot. France 69: 351–352. 1922.

2415. Goris, Albert. **Sur l'existence d'une petite colonie de Cyclamen aux environs de Bagnères-de-Bigorre.** [The existence of a little colony of Cyclamen in the vicinity of Bagnères-de-Bigorre.] Bull. Soc. Bot France 70: 198–199. 1923.

2416. Hibon, G. **Aperçu de la végétation d'un petit coin de la Gironde au mileau d'Avril.** [Vegetation of a little corner of the Gironde in the middle of April.] Bull. Soc. Bot. France 69: 314–317. 1922.

2417. Ising, E. H. **Eucalypts—Adelaide to Mount Lofty.** South Australian Nat. 2: 63–68. 1921.—The following are described in their general biological aspect: *E. rostrata* Schlecht, *E. leucoxylon* F. v. M., *E. fasciculosa* F. v. M., *E. viminalis* Labill., *E. rubida* H.D. & J.H.M., *E. odorata* F. v. M., *E. obliqua* L'Her., and *E. capitellata* Smith.—*Wm. Randolph Taylor.*

2418. Kühnholtz-Lordat, G. M. **A propos du Polystichum Oreopteris DC.** Bull. Soc. Bot. France 70: 64–68. 1923.—The author discusses the habitats of *Polystichum Oreopteris* DC. and a few associated plants.—*P. A. Young.*

2419. Pavillard, J. **Glanes floristiques autour de Montpellier.** [Flora around Montpellier.] Bull. Soc. Bot. France 70: 467–471. 1923.—The author discusses the distribution of a few unusual species and considers the possible limiting factors.—*P. A. Young.*

2420. Raphélis, A. **Sur le Peyssonnelia polymorpha (Zanard.) Schmitz. Stations nouvelles.** [New localities for P. polymorpha.] Bull. Soc. Bot. France 69: 452–454. 1922.

2421. Rodié, M. J. **Note sur les plantes d'un terrain inculte aux environs de Montpellier.** [Note on the uncultivated ground near Montpellier.] Bull. Soc. Bot. France 70: 141–146. 1923.—The author discusses the plants growing on land which has not been cultivated recently.—*P. A. Young.*

2422. Rupp, H. **Notes on the habits of certain orchids.** Australian Nat. 5: 166–171. 1924.

2423. Schwarz, E. H. L. **Former fertility of the Kalahari desert.** Nature 114: 312.

1924.—A specimen of *Arundinaria tessellata* Monroe is cited as further evdence of more humid conditions existing not long ago.—*O. A. Stevens.*

2424. Strøm, K. M. **Studies in the ecology and geographical distribution of freshwater algae and plankton.** Rev. Algologique 1: 127–155. *2 fig.* 1924.—The habitats of fresh-water algae are subaerial, wet or inundated rocks grading into freshwater, and snow and ice. For the lst, *Protococcus viridis*, *Prasiola crispa* and *Trentepohlia* are important. On wet rocks Gloeocapsae, Scytonemeae and Zygnemeae are important in Sweden, with *Cosmarium dovrense* and *Oocardium stratum* in some calcareous localities. Arctic-alpine species occur at lower levels on wet rocks than in lakes or bogs, although the temperature may be no lower. Rhodophyceae are relatively rare in Scandinavia; Zygnemas seems to replace the Cladophoras of central Europe, and *Hydrurus foetidus*, *Prasiola fluviatilis* and diatoms are abundant in the alpine streams. *Calothrix parietina* is the most important alga in the mountain lakes on the shores; but the lakes are less rich than the alpine lakes of central Europe. The richest localities are small pools, ditches, etc. The algal flora on aquatic plants and among submerged mosses from such places is the richest known, reaching about 500 species, and the associations from aquatic plants show differences from those among mosses. Localities outside the peaty moors show notable richness in Protococcoideae, and the desmid and diatom species differ in the moor and extra-moor regions. Seasonal periodicity is often evident in the lowlands but is partially absent in the mountains. One of the most essential factors in distribution is the pH of the water. Aeration and stagnation operate both on the pH and on the proportion of the dissolved gases. Red snow is abundant in Scandinavia, usually due to *Chlamydomonas nivalis*, though *Chionaster nivalis* is sometimes present in vast quantities. Green snow is rare and is composed of *Ulothrix flaccida*. In the hot springs, *Rhormidium laminosum*, *Hapalosiphon laminosus*, *Oscillatoria geminata*, *O. animalis* and *O. Okeni* are most important, and are cosmopolitan in such localities. A discussion of general features of parasitism and epiphytism is given. The tropical types of algae are the most limited in area; the north temperate are more widely distributed. The barriers which check distribution are oceanic, or more important, desert or dry limestone areas. The statement that there are no desmids in genuine plankton is false, as also that the forms composing genuine plankton are cosmopolitan. The presence of desmids in abundance is inhibited by contamination and a water reaction pH>7. Nothing is known regarding the biology of tropical plankton, although rich desmid plankton does occur. The zooplankton is dealt with. A discussion of the Scandinavian alpine conditions in particular is given (See: Strøm, K.M. The algae-flora of the Sarek Mountains. Naturwissensch. Untersuch. Sarekgebirges Schwedisch-Lappland 3: 437–521. 1923.) (See also Bot. Absts. 13, Entry 5933.) The 7 seasonal classes of algae defined by Transeau could not be recognized in the high mountains of Norway. *Cylindrocystis Brebissonii* in peaty bogs and moors is succeeded by an association of *Chroococcus turgidus* and *Synechococcus aeruginosus* in the autumn. *Hyalotheca dissiliens* is common with *Cylindrocystis* but in other localities does not appear until August or September. The general maximum of most of the algae occurs during August in the high mountains and continues into the autumn. Wintering-over is not dependent on zygospore formation as commonly stated. Many Zygnemaceae and Oedogoniaceae have 2 congugating seasons, one in early summer and one in autumn. Many algae which form spores also survive the winter in a vegetative condition. The same is true for desmides. The autumnal decrease is slow and abundant growths persist into November.—*Wm. Randolph Taylor.*

2425. Sutton, E. E. **Bibliography of the Australasian floristic and ecological plant-geography.** Rept. Australasian Assoc. Adv. Sci. 16: 110–118. 1923.

2426. Taylor, Norman, and Helen Smith Hill. **Crowberry at Montauk, Long Island.** Torreya 24: 87. 1924.—*Empetrum nigrum* L., an Arctic-alpine species previously known at sea-level only from the coast of Maine, was collected near the ocean beach within 200 feet of the temporary laboratory of the Brooklyn Botanic Garden at Montauk, Long Island.—*J. C. Nelson.*

2427. Town, W. G. **Re-colonisation of a woodland flora after burning.** Naturalist 1924: 169–170. 1924.—After fire had destroyed the ground vegetation in Peckett Wood, Hebden Bridge, *Ceratodon purpureus* was one of the earliest mosses to reappear. *Epilo-*

bium angustifolium, *Rumex acetosella* and *Teucrium Scorodonia* were the first phanerogams to arrive.—*W. H. Burrell.*

2428. Wall, A. **The botany of Christchurch.** *41 p.* The Lyttelton Times Co.: Christchurch, New Zealand. [1922].—The paper gives details of plant stations, with a complete list of species, in the vicinity of Christchurch, New Zealand.—*H. H. Allan.*

2429. Willis, J. C. **The inadequacy of the theory of natural selection as an explanation of the facts of geographical distribution and evolution.** (Abstract) Rept. British Assoc. Adv. Sci. 1922: 399. 1923.

FORESTRY

W. N. Sparhawk, *Editor*

(See also in this issue Entries 2125, 2126, 2127, 2196, 2252, 2271, 2272, 2274, 2285, 2293, 2314, 2362, 2369, 2370, 2381, 2383, 2395, 2403, 2412, 2416, 2657, 2664, 2670, 2671, 2679, 2698, 2720, 2832, 2848, 2929, 2930)

2430. Anonymous. **British Empire Forestry Conference, Canada, 1923.** Quart. Jour. Forest. 18: 177–182. 1924.—The resolutions passed at the Conference which assembled in Ottawa in July, 1923, are given verbatim.—*P. S. Spokes.*

2431. Anonymous. **Determining the fire hazards in a forest.** Sci. Amer. 130: 329. *1 fig.* 1924.—The use of an evaporimeter for detecting the approach of danger periods is described.—*Chas. H. Otis.*

2432. Anonymous. **Le parasolier.** [The umbrella tree.] Bull. Trimest. Soc. Forest. Franche- Comté et des provinces de l'Est 15: 275–276. 1924.—*Musanga Smithii* R. Br. grows on the west coast of Africa from French Guinea to the mouth of the Congo, from 0 to 1000 m. altitude, chiefly in open places. It reaches 20–25 m. in height and 40 cm. in diameter. Its wood is very light and weak. The tree grows rapidly and sprouts would be exploitable for paper pulp in 3 years. It should yield annually 30–40 cubic m. of wood per ha.—*J. Kittredge Jr.*

2433. Anonymous. **National conference on the utilization of forest products.** Science 60: 353. 1924.

2434. Anonymous. **The Imperial Forestry Institute.** Quart. Jour. Forest. 18: 262–265. 1924.—This is a brief description of the scope of work to be carried out by the British Imperial Forestry Institute at Oxford University.—*P. S. Spokes.*

2435. Anonymous. [**Rev. of:** Baker, Richard T., and Henry G. Smith. **Wood-fibers of some Australian timbers: investigated in reference to their prospective value for paper pulp production.** *159 p.* Alfred J. Kent: Sydney, 1924.] Nature 114: 190. 1924.

2436. Anonymous. [**Rev. of:** Kellogg, R. S. **Pulpwood and wood pulp in North America** *12 + 273 p.* McGraw-Hill Publ. Co.: New York and London, 1923.] Nature 114: 47–48. 1924.

2437. Alexander, George W. **Intensive studies of local conditions as an aid to forecasting fire weather.** Monthly Weather Rev. 51: 561–563. 1923.—Three types of fire weather are recognized: lighting storms; periods of extremely high temperature or low humidity; and heavy, dry winds. These do not include the cumulative effect of seasonal factors which also affects the occurrence of fire weather. Forecasters have few data from forested regions upon which to base predictions, as most records are collected in cities or agricultural districts. It should be possible, by correlating data from many sources, and with the increasing knowledge of what constitutes fire weather, to work out useful forecasts.—*E. N. Munns.*

2438. Anderson, M. L. **Thinning practice.** Quart. Jour. Forest. 18: 125–132, 209–216. 1924.—The author deals with the subject from a practical aspect and has devised a method of uniform treatment of woods by means of a system of stem-classification which follows closely that used in Sweden, Canada and Great Britain. The classification consists in dividing the canopy into 4 levels; predominant and dominant, co-dominant, subdominant, and suppressed. Each of these classes is again subdivided according to crown development, combined with form and shape of the stems. The strength and nature of the thinning must depend on the species, rate of growth, and existing economic conditions. The German low thinning and the French

crown-thinning methods and their variations are described. A range of thinning grades is advocated to meet the introduction of new species and changes in management. Under ordinary conditions more emphasis should be laid on the crown thinning methods than has hitherto been the practice.—*P. S. Spokes.*

2439. Barbey, A. **Une exploitation forestière de grand style.** Bull. Trimest. Soc. Forest. Franche-Comté et des provinces de l'Est **15**: 243–248. *Pl. 1.* 1924.—A logging operation of 420 ha. of silver fir on rough, rocky topography in the Jura is described. The stand averaged 250 cubic m. to the ha. Decauville track and caterpillar tractors were used. The area was cut so clean that broad-leaved species will have to be planted first; in their shelter it may be possible to re-establish fir and beech.—*J. Kittredge, Jr.*

2440. Bates, C. G. **Evaporation as a simple index to weather conditions.** Monthly Weather Rev. **51**: 570–571. 1924.—The evaporation rate apparently cannot be considered as important a factor of fire hazard as the shape of the evaporation curve. Periods of high evaporation agree fairly closely with periods of extreme fire hazard.—*E. N. Munns.*

2441. Beeson, C. F. C. **The economic importance and control of the sal heartwood borer. (Hoplocerambyx spinicornis).** Indian Forest. **50**: 516. 1924.—This borer has affected 5,000 acres of sal at the base of the Himalayas. The attack is made during the rainy season; the larvae develop in the sapwood, girdling the tree, and finally the trees succumb. Control measures carried on for 4 years practically eliminated the insect. A greater than average rainfall during the past 4 years may have helped to reduce the infestation.—*E. N. Munns.*

2442. Bennett, W. H. **Estate forest tree nurseries.** Quart. Jour. Forest. **18**: 90–93. 1924.—Notes on formation and management of forest nurseries are given.—*P. S. Spokes.*

2443. Billings, C. L. **Slash disposal in privately owned white pine stands.** Timberman **25**: 222. 1924.—This is an account of experiments in northern Idaho during the summer of 1923.—*Duncan Dunning.*

2444. Borthwick, A. W. **Farm forestry.** (Abstract.) Rept. British Assoc. Adv. Sci. **1922**: 401. 1923.

2445. Bourne, R. **A note on a recent forest tour in Germany.** Quart. Jour. Forest. **18**: 319–332. 1924.—This is a critical account of a tour of forests in Prussia, Hessen, Baden, Wurttemberg, and Saxony, undertaken with a view of studying the varied methods of silvicultural treatment of oak, beech, Scots pine, spruce, and silver fir. Examples are described of (1) simple coppice of oak, (2) coppice with standards, (3) standards over coppice in process of conversion to the selection system, (4) two methods of growing oak and beech high forest under the shelterwood compartment system, (5) two methods of Scots pine regeneration, (6) spruce, silver fir, beech, and Scots pine regeneration by clear felling and planting, (7) regeneration of the same species under Wagner's "Blendersaumschlag," and (8) their regeneration under systems varying from the shelterwood compartment system to the selection system.—*P. S. Spokes.*

2446. B[raid], K. W. **Text-book of Australian forest botany.** [Rev. of: White, C. T. **An elementary text-book of Australian forest botany.** Vol. 1. *iii* + *223 p. Illus.* Forestry Commission: Sydney, New South Wales, 1922 (see Bot. Absts. 13; Entry 5002).] Kew Bull. **1923**: 351–352. 1923.—"This is an excellent work of reference and its clear arrangement and handy size should also commend it."—*T. J. Fitzpatrick.*

2447. Brüel, G. **Jordbunden i Grib Skov. [A soil survey of Grib Forest.]** Forst. Forsögsv. Danmark **5**: 64–104. *2 fig.* 1916-1920.—A detailed account of the soil formations in Grib Forest is given. The original survey was made in 1804 and still holds good as a basis for management plans.—*T. S. Hansen.*

2448. C. **Creeping fires.** [Rev. of: Kessell, S. L. **The damage caused by creeping fires in the forest.** Western Australian Woods and Forests Dept. Bull. 33. *1–15.* 1924 (see Bot. Absts. 14, Entry 1313).] Indian Forest. **50**: 541–547. 1924.—The ordinary forest resident is often glad to find an excuse for burning over the forest. India has the light burning problem as well as America and the eucalypt forest region of Australia.—*E. N. Munns.*

2449. Carter, C. E. **Denizens of the Australian Bush.** Amer. Forests and Forest Life **30**: 140-143. *6 fig.* 1924.—The forests and trees of Australia are briefly mentioned.—*Chas. H. Otis.*

2450. Champion, H. G. **Seed production of pines tapped for resin.** Indian Forest. 50: 445. 1924.—With Indian species, especially *Pinus longifolia*, there is no marked difference between tapped and untapped trees, in the quantity or quality of seed produced.—*E. N. Munns.*

2451. Cheney, E. G. **A Phoenix of the lumber industry.** Amer. Forests and Forest Life 30: 239–242. *3 fig.* 1924.—Cloquet, Minnesota, and its forest products industries are described.—*Chas. H. Otis.*

2452. Chenoweth, A. K. **A forest without benefit of clergy.** Amer. Forests and Forest Life 30: 288–290, 317. *3 fig.* 1924.—The John Bryan Natural History Reserve, situated near Yellow Springs, Ohio, is described.—*Chas. H. Otis.*

2453. Cottam, W. P. **Utah's giant fir.** Amer. Forests and Forest Life 30: 109. *1 fig.* 1924.—This is an account of a white fir (*Abies concolor*) 110 feet high and 20 feet in circumference at the base, located on Mt. Timpanogos, Utah.—*Chas. H. Otis.*

2454. Crothers, E. M. **The working of the Hornby charcoal kiln.** Indian Forest. 50: 501–510. *Pl. 20.* 1924.—The method of operating this type of kiln, made of steel, is described. Charcoal so made is rated as much higher in quality than that produced by ordinary kiln methods.—*E. N. Munns.*

2455. Dallimore, W. **Arboretum notes. The care of old trees.** Quart. Jour. Forest. 18: 45–49. 1924.

2456. Dallimore, W. **Poplars for farm land.** Kew Bull. 1923: 95. 1923.—Suggestions are given on the selection of suitable species and sites and on methods of planting.—*T. J. Fitzpatrick.*

2457. Dallimore, W. **Uses of cedar wood.** Kew Bull. 1923: 95, 96. 1923.—Ways are suggested for owners of estates to utilize fallen *Cedrus Libani.*—*T. J. Fitzpatrick.*

2458. Dallimore, W. [**Rev. of:** Bunbury, H. M. **The destructive distillation of wood.** *xx–320 p.* Benn Bros.: London, 1923.] [See also Bot. Absts. 13, Entry 1539.]

2459. Director of the Imperial Institute. **British Honduras timbers. Part I.** Bull. Imp. Inst. 21: 570–585. 1923.—Only mahogany and cedar are now exported from British Honduras for wood. Detailed mechanical and working tests are given for 4 others: banak (*Myristica* sp.), santa maria (*Calophyllum* sp.), sam wood (indeterminable), and black poison-wood (Anacardiaceae).—*L. A. Kenoyer.*

2460. Director of the Imperial Institute. **Results of the examination of Nigerian timbers.** Bull. Imp. Inst. 21: 444–461. 1923.—This report gives the results of mechanical and working tests of the wood of the following 6 trees, which are deemed sufficiently valuable to be worthy of export to the United Kingdom: *Terminalia superba*, *Piptadenia africana*, *Brachystegia spicaeformis*, *Afzelia africana*, *Pterolobium* sp., and *Chlorophora excelsa.*—*L. A. Kenoyer.*

2461. Director of the Imperial Institute. **The cultivation of black wattle.** Bull. Imp. Inst. 21: 607–626. 1923.—Black wattle (*Acacia mollissima*) is grown in Natal and Kenya Colony for tan-bark and various by-products. To aid in the profitable introduction of the tree into other parts of the empire, this article takes up in some detail its climatic and soil requirements; methods of planting, cultivation, spacing, rotation, pruning, felling, drying the bark, and intercropping; insect pests; and utilization of the timber.—*L. A. Kenoyer.*

2462. Director of the Imperial Institute. **The trees of the Gold Coast.** Bull. Imp. Inst. 21: 348–363. *2 pl.* 1923.—The information was supplied by J. M. Dalziel. In some places the vegetation is savannah-like, other places have been cleared for agriculture, in still others there are dense evergreen forests. Descriptions are given of the appearance, habits and uses of the following trees: *Eriodendron orientale* (silk cotton), *Chlorophora excelsa* (odum), *Triplochiton Johnsoni* (African maple), *Piptadenia africana* (dahomah), *Terminalia* spp., *Musanga Smithii* (umbrella tree), *Khaya* spp. (mahogany), *Pseudocedrela* spp. (African cedar) *Bombax buonopozense* (red-flowered silk cotton), *Carapa procera* (crabwood), *Anthocleista* spp., *Alstonia congensis*, *Funtumia elastica* (African rubber), *Cola acuminata* (kola), *Anogeissus leiocarpus* (chew-stick), *Paradaniella Oliveri* (frankincense), *Butyrospermum Parkii* (shea-butter), *Parkia filicoidea* (locust bean), *Afzelia africana*, *Adansonia digitata* (baobab), *Borassus flabellifer* (fan palm).—*L. A. Kenoyer.*

2463. Director of the Imperial Institute. **Wattle bark from Ceylon.** Bull. Imp. Inst. 21: 466–468. 1923.—Samples of bark of *Acacia dealbata*, *A. decurrens*, and *A. mollissima* from Ceylon are found to contain 23–33% tannin. They probably would be available for export to the United Kingdom to supplement the present supply, which comes mainly from Natal.—*L. A. Kenoyer.*

2464. Eckbo, N. B. **A forester in Oom Paul's country.** Amer. Forests and Forest Life 30: 79–82, 113. *11 fig.* 1924.—This popular article gives some facts concerning the forests and trees of South Africa.—*Chas. H. Otis.*

2465. Flint, Howard R. **How weather forecasts can aid in forest fire control.** Monthly Weather Rev. 51: 567–569. 1923.

2466. Forbes, A. C. **Notes on the Empire Forestry Conference in Canada.** Quart. Jour. Forest. 18: 158–164, 199–208. 1924.—Several features of Canadian forests, which are not met with under European conditions, are of interest to British foresters. The factors which have emphasized the importance of these forests as sources of national wealth are stated. Notes are given on climate, types of forest, administration, systems of forest control, insect enemies and fungous diseases, fire protection, and management. Fire prevention and the reservation of non-agricultural land for forest growth are stressed.—*P. S. Spokes.*

2467. Forbes, W. **The afforestation of commons.** Quart. Jour. Forest. 18: 50–53. 1924. —The greater part of the commons of Great Britain is waste land but it is capable of producing good timber if the proper species are selected and carefully managed. Afforestation by common effort for the common benefit is recommended.—*P. S. Spokes.*

2468. Ford-Robertson, F. C. **Regeneration fellings in theory and practice.** Indian Forest 50: 510–516. 1924.—German silviculturists are beginning to abandon their former strict adherence to theoretical systems. Instead of sowing and planting on an extensive scale, more care is taken to secure natural reproduction, and to protect and encourage advance growth. Shelterwood and group felling permit the forester to take advantage of all the help nature can give in reducing the rotation and utilizing the soil completely. Intensive silviculture is possible because of good roads, trained personnel, good soils, suitable species, and the returns from thinnings.—*E. N. Munns.*

2469. Greeley, W. B. **The scientific background of the forest policy of the United States.** Science 59: 449–452. 1924.—After reviewing various phases of the forestry problem in the U. S. A., the need of scientific forest culture and better utilization of forest products is pointed out. The 1st involves research in the relations between climate, soils, and laws of growth. The 2nd particularly concerns problems in chemistry and mechanical properties of wood.—*C. J. Lyon.*

2470. Haasis, F. W. **A chance for reforestation.** Amer. Forests and Forest Life 30: 298–300, 306. *4 fig.* 1924.—The possibility of reforesting the land around Ducktown, Tennessee, which has been completely denuded by smelter fumes, should be investigated.—*Chas. H. Otis.*

2471. Hadley, E. W. **Growth and regeneration of pine forests in California.** [Rev. of: Dunning, Duncan. **Some results of cutting in the Sierra forests of California.** U. S. Dept. Agric. Bull. 1176. *1–27.* 1923.] Indian Forest. 50: 476–478. 1924.

2472. Hastings, G. T. [Rev. of: Kellogg, R. S. **Lumber and its uses.** Revised by Franklin H. Smith. *370 p. 98 fig.* U. P. C. Book Co.: New York, 1924 (see this issue, Entry 2488).] Torreya 24: 58–59. 1924.—The book will be chiefly valuable to commercial users of wood.—*J. C. Nelson.*

2473. Hauch, L. A. **Nattefrostens Virkning i ung Bøgeskov.** [**The effect of late frosts on young beech forests.**] Forst. Forsögsv. Danmark 5: 39–63. *21 fig.* 1916–1920.—Beech in the Danish forests has shown itself to be susceptible to injury by late spring frosts. It eventually overcomes this tendency and in the mature stage it is quite hardy. This susceptibility to injury in the early stages accounts for the irregular forms of many mature trees.—*T. S. Hansen.*

2474. Hauch, L. A. **Proveniensforsøg med Eg. II.** [**Source of seed experiments with oak.**] Forst. Forsögsv. Danmark 5: 195–224. *6 fig.* 1916–1920.—Planting experiments with various species of oak from Holland, Russia, Galicia, Hungary, Slavonia, Moravia, Austria,

Hanover and Denmark were attempted. The seed of the native oaks produced the most hardy plants. The use of local seed is recommended. This is not always possible because Denmark is the northern limit of the range of oaks and seed is produced only in limited quantities. When using foreign seed it is necessary to have definite information concerning its source. Lacking this it is recommended that the seed be not used.—*T. S. Hansen.*

2475. Helms, Johs., and Paul Wegge. **Prickleforsøg paa Silkeborg og Vemmetofte Skovdistrikter. [Transplanting experiments on Silkeborg and Vemmetofte forest districts.]** Forst. Forsögsv. Danmark 5: 225-292. *41 fig.* 1916-1920.—Several different transplanting methods were tried, using *Picea excelsa, Abies pectinata* and *A. nordmanniana.* These experiments showed that sorting of seedlings for transplanting is advisable, that moderate root pruning is beneficial, that trench transplanting is practical, and that moderately well packed earth gives the best results.—*T. S. Hansen.*

2476. Henry, A. **The cultivation of poplars.** (Abstract) Rept. British Assoc. Adv. Sci. 1922: 401. 1923.

2477. Herrmann. **Bericht über die Waldsamenernte für 1924. [The 1924 crop of forest tree seeds.]** Deutsch. Forstzeitg. 39: 1030-1032. 1924.—This is a summary of reports from various localities in Prussia and parts of neighboring States. For nearly all the important species the crop is light.—*W. N. Sparhawk.*

2478. Hiley, W. E. **A forest policy for landowners.** Quart. Jour. Forest. 18: 54–61, 146–157, 311–318. 1924.—The present conditions of estate woodlands in Britain are described and compared with other countries, and the causes which have prevented their efficient utilization are dealt with. The absence of conifers from the English flora is considered to have been largely responsible for the small extent of the forest area, whereas in Germany and Austria forestry was undertaken as a state enterprise owing to forests being originally preserved as hunting grounds. The results of a census of woodlands in 3 counties are quoted and the annual increment is calculated.—The 2nd article discusses the economic and financial aspects of estate forestry, and the 3rd deals with the development of estate woodlands. The return which may normally be expected from such species as Douglas fir, larch, Scots pine, and Corsican pine is calculated. The growing of oak and beech woods is shown to be unprofitable. The author urges that landowners coöperate in putting their woods under coördinated, scientific management.—*P. S. Spokes.*

2479. Hofmann, J. V. **Meteorological factors and forest fires.** Monthly Weather Rev. 51: 569. 1923.—There appears to be a fairly reliable and definite relation between relative humidity and forest fires. The prediction of change in humidity is the next difficult step in forest fire work. The relation between static electricity and humidity appears to be close enough to warrant using static as a guide in this prediction.—*E. N. Munns.*

2480. Hopkins, A. A. **A museum in the open air.** Sci. Amer. 130: 102. *3 fig.* 1924.—This is a popular article on the Arnold Arboretum, near Boston, Massachusetts.—*Chas. H. Otis.*

2481. Hosmer, R. S. **The forest policy of New York.** Amer. Forests and Forest Life 30: 349-350. 1924.

2482. Illick, J[oseph] S. **The water woods of York.** Amer. Forests and Forest Life 30: 264-266. *3 fig.* 1924.—This is an account of the plantings on the watershed of the York Water Company, on Codorus Creek, Pennsylvania.—*Chas. H. Otis.*

2483. Illick, Joseph S. **Tree habits. How to know the hardwoods.** *iv + 337 p. Illus.* Amer. Nature Assoc.: Washington, D. C., 1924.—Approximately 150 North American broad-leaved trees are described in non-technical language.—*W. N. Sparhawk.*

2484. Ilvessalo, Yrjo. **The forests of Finland. The forest resources and the condition of the forests.** (Reprinted from Communicationes ex Instituto Quaestionum Forestalium Finlandiae Editae 9.) *40 p. 27 fig.* Helsinki, 1924.—The main results of a general forest survey are presented. The survey was accomplished by running parallel strips across the country 25 km. apart, checked by sample plots at 2 km. intervals on each line. A mathematical analysis of the data shows that lines at closer intervals would make very little change in the estimates, which may therefore be considered sufficiently accurate.—Productive forest land forms 58.61% and poor forest land 14.92% of the total land area of 34,359,900 ha. and there are

7.4 ha. of forest land per capita of population. Privately owned lands comprise 51.0% of the area, ordinary State lands 38.9%, joint stock companies 7.5%, State fief-lands 0.9%, ecclesiastical fief-lands 1.0%, and communal lands 0.7%. The classification of productive and poor forest lands is shown by types, which are based on the character of the surface vegetation under a fully stocked stand at exploitable age. These forest types, or site classes, are briefly described. Of the productive forest, 28.4% is on sites above the medium quality, and 42.1% is below the medium. Woods enclosed for grazing purposes comprise 10.6% of the forest area, mostly on the better sites. Forests dominated by conifers (*Pinus silvestris* and *Picea excelsa*) comprise 80.0% of the forest area; those dominated by deciduous species (*Betula odorata*, *B. verrucosa*, *Alnus incana*, *A. glutinosa*, and *Populus tremula*) 18.6%, and 1.4% is denuded. The distribution of the different kinds of forest on the several types of land is shown. There is a marked deficiency of younger age classes in all parts of the country, while mature stands are scarce in the south but fairly well represented in the north. The total stand is 1620 million cubic m., or 476 cubic m. per capita and 64.3 cubic m. per ha. There are 1557 million merchantable trees in the country, 204 million being more than 30 cm. in diameter at breast height, and the others 20–30 cm. The annual increment is 44.4 million cubic m., or a little more than the cut, although over-cutting is common in the best forests. Both stand and increment are much below normal, or what they would be with better silviculture. The various data are shown in detail as to provinces, classes of owners, and classes of land, in numerous tables and diagrams.—*W. N. Sparhawk.*

2485. Joy, George C. **Forest fire weather in western Washington.** Monthly Weather Rev. 51: 564–566. 1923.—Forest fire weather results from the movement of high and low pressure areas. Under certain conditions, hot, dry winds prevail and forest fires are numerous, destructive and difficult to handle.—*E. N. Munns.*

2486. Judd, C. S. **Report of the Division of Forestry [Territory of Hawaii] for the biennial period ended December 31, 1922.** Reprint from [Bien.] Rept. Bd. Commissioners Agric. and Forest. Hawaii 1922: 19–51. *9 pl.* 1923.—The forest reserves now embrace 841,915 acres, 68% of which belongs to the Territory. A total of 109,442 trees of 120 species were planted on the 15 different forest reserves on the 4 main islands, and 423,551 trees were distributed for planting, on the reserves and on private land. A total of 2980 trees of 3 species yielding chaulmoogra oil were planted on 27 acres of the Waiahole Reserve (Oahu). A list of articles by members of the Division of Forestry is given.—*J. M. Westgate.*

2487. K., S. Z. **Böhmisches Nonnenholz. [Timber killed by the nun-moth in Bohemia.]** Deutsch. Forstzeitg. 39: 1062. 1924.—Millions of moth-killed trees have been cut in northern Bohemia. Most of the timber will go to German markets.—*W. N. Sparhawk.*

2488. Kellogg, Royal S. **Lumber and its uses.** Revised by Franklin H. Smith. *3rd ed. xi + 370 p. 98 fig.* U. P. C. Book Co.: New York, 1924.—The author discusses briefly, in non-technical language, the structure and physical properties of wood in general; the classification, measurement, and grading of lumber and structural timbers; wood seasoning and preservation; paints, wood finishes, and fire proofing materials; wood paving and flooring; lumber prices and building costs; the utilization of lumber by various industries; the principal uses of each kind of wood; and the economics of the lumber industry and timber supply in the U. S. A. (See also this issue, Entry 2472.)—*W. N. Sparhawk.*

2489. Korstian, C. F. **A silvical comparison of the Pacific coast and Rocky Mountain forms of western yellow pine.** Amer. Jour. Bot. 11: 318–324. *1 fig.* 1924.—*Pinus ponderosa* (of the Pacific coast) and its variety *scopulorum* (of the Rocky Mountains) are distinguished not only by various structural characters, such as size of leaves and cones and color of young leaves, buds and pistillate flowers; but also by certain ecological differences. The former has a larger seed, a longer period of germination, more vigorous early growth and a better root system than the latter, but it succumbs more quickly to drought. The oils and oleoresins of the 2 types are distinctly different. The leaves of the *scopulorum* form are more compact in structure and thicker, with cells closer together and stomata more deeply depressed. The more xerophytic environment of var. *scopulorum* probably accounts for many of these differences. Climatic varieties of forest trees should be taken into account in silvicultural practice.—*E. W. Sinnott.*

2490. Lesseux, C. de. **Le carburant-bois pour les moteurs d'autos.** [**Wood combustion as a source of power for automobile motors.**] Bull. Trimest. Soc. Forest. Franche Comté et des provinces de l'Est **15**: 265–271. 1924.—Carbon monoxide from the combustion of charcoal at high temperatures has been tested as a source of power in automobile motors. A hectare of coppice at 30 years will yield 200 steres of wood, which at the rate of 88 kgm. of charcoal to the stere is equivalent to 17.6 tons of charcoal. As a 16 horse-power motor consumes 16 kgm. of charcoal per 100 km., 1 ha. of coppice would furnish motive power for 110,000 km. The total consumption in France might amount to 400,000 tons. As 5 departments could furnish 24% of this amount, it is concluded that French forests could supply the demand.—*J. Kittredge, Jr.*

2491. L[esseux], C. de. **Une belle coupe.** · [**A fine cutting area.**] Bull. Trimest. Soc. Forest. Franche Comté et des provinces de l'Est **15**: 277–279. 1924.—Details of the marking and the yield on an area of 4.94 ha. in the Forest of Colmar are given. The area yielded 189 cu. m. and a net profit of 23,740 francs to the hectare. One ash with a volume of 4.06 cu. m. brought 2400 francs. These results are not exceptional in the forests of the vicinity.—*J. Kittredge, Jr.*

2492. Le Sueur, A. D. C. **The common ash.** Quart. Jour. Forest. **18**: 217–227. 1924.—Notes are given on the soil requirements, propagation, cultivation, wood structure, properties, and utilization of the common ash (*Fraxinus excelsior*) in England—*P. S. Spokes.*

2493. Liese. **Zum Forleulenfrass.** [**Damage by the pine owl moth.**] Deutsch. Forstzeitg. **39**: 1061. 1924—Blazing the trunks of defoliated trees, as recommended by Luban (See Bot. Absts. 14, Entry 1319.) is likely to do more harm than good. Healthy trees might respond to a wound stimulus, but those weakened by defoliation will not.—*W. N. Sparhawk.*

2494. Lotbiniere, H. G. J. de. **Forestry tour in Norfolk.** Quart. Jour. Forest. **18**: 101–105. 1924.—This is a description of Lord Hasting's woodlands at Melton Constable, Suffolk County, England, consisting of some 400 acres of oak, chestnut, beech, Scots pine, and Douglas fir. Notes and measurements are also included of specimen trees in Fulmodestone Wood owned by Lord Leicester.—*P. S. Stokes.*

2495. Lovat, [Simon J. F.]. **The position of British forestry today.** (Abstract) Rept. British Assoc. Adv. Sci. **1922**: 401. 1923.

2496. McKee, E. R. **Keeping up our spirits—of turpentine.** Amer. Forests and Forest Life **30**: 72–74. *9 fig.* 1924.—The old and new methods of turpentining are compared.—*Chas. H. Otis.*

2497. Mattoon, W. R. **Black walnut—where and how to plant it.** Amer. Forests and Forest Life **30**: 347–348, 362. *3 fig.* 1924.

2498. Merrill, M. C. **Forest service research conference.** Science **59**: 571–572. 1924.—The conference held at Madison, Wisconsin, in March, 1924, discussed studies dealing with forest fire control, forest mensuration, and forestry practice.—*C. J. Lyon.*

2499. Millier, J. M. **Quebracho Colorado.** Kew Bull. **1923**: 191, 192. 1923.—*Quebrachia Lorentzii* Griseb. (Anacardiaceae) is an important forest tree of northern Argentina and occurs also in Paraguay. The hard, close-grained, durable wood is much used for railway ties. Recently it has become one of the principal sources of vegetable tannin. The Quebracho forests are in danger of extinction owing to the wasteful methods of exploitation. The present supply will last about 25 years. With proper forestry methods, the natural stock can be replaced in 25–50 years. To meet future needs, energetic measures for replacing felled trees and establishing new forests must be adopted.—*T. J. Fitzpatrick.*

2500. Mørk-Hansen, K. **C. H. Schröders Udhugning i Bøg.** [**C. H. Schröder's thinning in beech forests.**] Forst. Forsögsv. Danmark **5**: 155–179. *2 fig.* 1916–1920.—Schröder's formula for thinning is to "remove that which is doing harm and that which no longer is beneficial," and he cuts principally the dominant trees. The benefits of this system are: (1) A better form of tree is produced; (2) the formation of humus is aided; and (3) grasses and sedges do not come in and form a sod.—*T. S. Hansen.*

2501. Mulford, Walter. **Forestry notes.** Sierra Club Bull. **1923**: 447–452. 1923.

2502. Mulford, Walter. **Forestry notes.** Sierra Club Bull. **1924**: 94–101. 1924.—The destruction and protection of wild flowers and the comparative growth of different tree

species on cut-over lands are discussed. Redwood is stated to produce 139,000 board feet per acre at 60 years under best conditions.—*Leonas L. Burlingame.*

2503. Mundt, K. H. **Den enstammede franske Bjaergfyr i Danmark.** [**The single boled French mountain pine in Denmark.**] Forst. Forsögsv. Danmark 5: 25-38. *8 fig.* 1916–1920.—One of the most interesting of the several varieties of *Pinus montana* is *Pinus montana uncinata rostrata* Willkomms. It has an upright form of growth and produces usable wood. As it is susceptible to attacks by *Lophodermium pinastri*, it is not recommended for reclamation planting. Its non-spreading form makes it undesirable for heath planting.—*T. S. Hansen.*

2504. M(unns), E. N. **Douglas fir regeneration.** [Rev. of: Hofmann, J. V. **Natural regeneration of Douglas fir in the Pacific Northwest.** U. S. Dept. Agric. Bull. 1200. 1–63. 1924.] Indian Forest. 50: 478–479. 1924.

2505. M(unns), E. N. **The effect of fires.** [Rev. of: Show, S. B., and E. I. Kotok. **The rôle of fire in the pine forests of California.** U. S. Dept. Agric. Bull. 1294. *1–78.* 1924.] Indian Forest. 50: 539–541. 1924.—Because of similarity between conditions in the forests of California and those of India where chir pine predominates, the facts and principles set forth should apply rather generally.—*E. N. Munns.*

2506. N., J. W. **Forest management in the United Provinces.** [Rev. of: Trevor, C. G. and E. A. Smythies. **Practical forest management.** *200 p.* Govt. Press: Allahabad, India, 1923.] Indian Forest. 50: 432. 1924.—The title is misleading as the book is a guide to management practice in only a very limited region. The chapter on yields omits necessary details and the measurements described as necessary are believed to be erroneous. Fire protection, particularly in bamboo forests, is entirely overlooked.—*E. N. Munns.*

2507. New Zealand State Forest Service. **Forests and forestry in New Zealand.** *36 p. 4 pl., 5 fig., 3 maps.* W. A. G. Skinner, government printer: Wellington, 1923.—This statement was prepared for the Imperial Forestry Conference at Ottawa. The principal forest types and commercial species are briefly described, with statistics and estimates of area, stand, ownership, cut, growth, consumption, exports, and imports. Forestry legislation and policies are outlined and the organization of the Forest Service is described. Considerable space is given to the activities of municipalities, corporations, and individuals, principally in planting, and to research in forestry and utilization of forest products. An appendix contains lists of reports, laws, and publications.—*W. N. Sparhawk.*

2508. Oppermann, A. **Bjaergfyr i Danmark paa Flyvesand og haevet Havbund.** [**Mountain pine in Denmark on sand dunes and raised ocean beds.**] Forst. Forsögsv. Danmark 5: 1–24. *2 fig.* 1916–1920.—In the reclamation of sand dune and heath areas, *Pinus montana* is best adapted to the regions of heaviest precipitation and greatest humidity. The character of soil seems to have little influence on the rate of growth. These conclusions are substantiated by growth measurements taken on 6 sample plots.—*T. S. Hansen.*

2509. Oppermann, A. **Sommerfaelding i Bøgeskov.** [**Summer cutting in beech forests.**] Forst. Forsögsv. Danmark 5: 180–194. 1916–1920.—A shortage of fuel in 1916 made necessary the summer cutting of beech cordwood for winter consumption. To determine the best method of seasoning, several different treatments were followed. Some trees were cut up immediately, split, and corded; others were allowed to lie with foliage on before splitting. It was found that trees felled in June or July were seasoned well enough for use in the fall. Summer cutting is not recommended except as an emergency measure.—*T. S. Hansen.*

2510. Parker, R. N., and B. L. Gupta. **New Indian species of forest importance, part VI.** Indian Forest. 50: 572–587. 1924.—This continuation of a paper in Indian Forest. 48: 247–258, 1922, lists 197 species.—*E. N. Munns.*

2511. Prescott, H. F. **How New York State is replacing her forests.** Amer. Forests and Forest Life 30: 166–168. *3 fig.* 1924.

2512. Röhrl. [Rev. of: Eckstein, K. **Die Kiefern- oder Forleule, Noctua piniperda.** [**The pine owl-moth.**] *32 p. 9 fig.* J. Neumann: Neudamm. 1924.] Forstwiss. Centralbl. 46: 478–479. 1924.—The reviewer cautions against raking the litter too early in the season, because if done before the caterpillars pupate it will not be effective. He also recommends burning the bark of trap trees instead of burying it or carrying it away. (See also Bot. Absts. 13, Entry 6503.)—*W. N. Sparhawk.*

2513. Sabroe, A. S. **Skovtroer i det nordlige Japan.** [Forest trees of northern Japan.] Forst. Forsögsv. Danmark **5**: 105–155. *28 fig.* 1920.—The trees of the temperate zone of Japan are described, and their value for planting in Denmark is also discussed.—*T. S. Hansen.*

2514. S[chaeffer], A. **Un peu d'histoire forestière.** [A little forest history.] Bull. Trimest. Soc. Forest. Franche Comté et des provinces de l'Est **15**: 257–261. 1924.—The French Forest School at Nancy is shortly to celebrate its 100th anniversary. At first the Forest Service was recruited from untrained men or from retired officers of Napoleon's army. Under the Restoration, most of that type were removed. Under Louis XVIII the need of technically trained personnel was recognized and the school was established in 1824.—*J. Kittredge, Jr.*

2515. Schlich, William. **Clear cutting or shelterwood.** Quart. Jour. Forest. **18**: 109–124. *3 fig.* 1924.—The question whether to clear cut a wood and restock it artificially or to regenerate it under a shelterwood is discussed with reference to conditions in Saxony, where clear cutting and the use of pure stands resulted in serious diminution of yield. The results of Wiedemann's investigations (published in 1923) are summarized. The author states his own observations on soil, climate, species, and financial considerations, and calculates that, in the several parts of the British Empire, "under favorable conditions of soil and climate clear cutting may be adopted, but where these are not existing the shelterwood method should receive first consideration, unless a soil protection wood is introduced at an early age, or simultaneously with planting." The regeneration of oak in the Spessart forest is cited as an example in which the mistakes in Saxony have been avoided.—*P. S. Spokes.*

2516. Schlich, William. **The damage done by creeping fires in the forest.** Indian Forest. **50**: 548. 1924.—Light burning is contrary to common sense. There may be times when fire can be used to clear the ground for regeneration, but after that fire protection is necessary.—*E. N. Munns.*

2517. Schubert. **Das Waldklima nach Untersuchungen in der Landsberger Heide.** [Studies of forest climate in the Landsberg heath.] Deutsch. Forstzeitg. **39**: 978–979. 1924.—Records of observations of several stations in the forest and on the open plain showed slightly lower daily mean and maximum temperatures and higher relative humidity in the forest. While the amount of precipitation was considerably less in the open, the difference can be almost entirely attributed to the effect of wind, and it is concluded that one of the most important influences of the forest upon local climate is the protection it affords against wind.—*W. N. Sparhawk.*

2518. Seaman, L. N. **Parrotia jacquemontiana for use as hammer handles.** Indian Forest. **50**: 459–462. 1924.—Wood of this species ranks high for handle purposes. Tests indicate it to be as valuable as *Dalbergia Sissoo* or *Olea ferruginea.* Comparable tests of transverse strength, and static and impact bending of this species with American hickories and ashes are given.—*E. N. Munns.*

2519. Shinn, C. H. **The giver of Muir Woods.** Amer. Forests and Forest Life **30**: 147–148. *2 fig.* 1924.—The article deals with William Kent and the redwoods in Muir Woods National Monument, 7 miles from San Francisco, California.—*Chas. H. Otis.*

2520. Show, S. B. **Lightning and forest fires in California.** Monthly Weather Rev. **51**: 566–567. 1923.—Lightning is the only real natural cause and is the most important cause of forest fires. Concentration of fires from 1 storm upon a single forest or group of forests, and the scattered location of these fires in relatively inaccessible places make them at times approach catastrophes. The movement and occurrence of storms are being noted at hundreds of the Forest Service lookouts to get the necessary data for predicting the path and perhaps the intensity of different classes of storms.—*E. N. Munns.*

2521. Singh, Bakshish. **Fire protection in sal forests.** Indian Forest. **50**: 410–414. 1924.—Because of the ease of regeneration of sal, and the comparative immunity of the seedlings from fire damage, the rather frequent uncontrolled fires during dry seasons are not harmful. Fire protection is believed to be detrimental after the seedlings are established as it permits the accumulation of so much leaf litter that when fires do start they often destroy the sal.—*E. N. Munns.*

2522. Spokes, P. S. **Some edaphic factors in forest ecology.** Quart. Jour. Forest. **18**:

333–346. 1924.—A summary is given of the indicator plant problem from the forester's viewpoint, the work of some of the more recent investigators being discussed. The merits of the 2 indicators of soil reaction, the pH value and the lime requirement, are compared. Fluctuation in reaction at different horizons in the soil and the rate of decomposition of the soil covering probably affect the quality of timber, according to the author's preliminary research on larch and Scots pine growng on sandy soil. A list of references is given.—*Author.*

2523. Spokes, P. S. **The soil-covering under certain forest crops.** Quart. Jour. Forest. 18: 62–72. 1924.—The chemical composition, physical properties, processes and rate of formation of humus in forest soils are briefly described with reference to Scots pine and European larch woods on tertiary sandy soils of the Thames Valley, England. The ratio between organic matter in the surface soil and depth of the soil covering is used as an indication of the rate of decomposition of the soil covering. A high figure indicates rapid, a low figure slow decomposition. Good quality of timber is correlated with rapid decomposition.—*Author.*

2524. Sudworth, G. B. **The Arizona cypress and weeping juniper.** Amer. Forests and Forest Life 30: 273–274, 317. *6 fig.* 1924.—*Cupressus arizonica* and *Juniperus flaccida* occur on the Chisos Mountains, in western Texas.—*Chas. H. Otis.*

2525. Swain, E. H. F. **Eucalyptian facts.** Queensland Agric. Jour. 21: 19. 1924.—Some peculiarities of eucalyptus forests and some facts concerning their regeneration and soil requirements are stated.—*W. D. Francis.*

2526. Sweet, J. M. **Silvicultural notes from Madras: result of clear felling on a seedling crop of Hopea parviflora.** Indian Forest. 50: 528–531. 1924.—The old timber was removed from an area of about 5 acres, following successful seeding operations. Although it appeared at the time that the damage would be great, only 7½% of the seedlings died. Before cutting there was an average of 1200 seedlings to the acre.—*E. N. Munns.*

2527. Tiemann, H. D. **Does paint preserve wood?** Sci. Amer. 130: 314–315. *6 fig.* 1924.—The behavior of painted and unpainted wood is correlated with structure, swelling and shrinking. Paint is not proof against gradual absorption of moisture and therefore will not prevent swelling or shrinkage; it does retard the rate of absorption or loss of moisture, thus giving time for a partial equalization of the moisture gradient within the piece of wood.—*Chas. H. Otis.*

2528. Toumey, J. W., and E. J. Neethling. **Insolation, a factor in the natural regeneration of certain conifers.** Yale Univ. School Forest. Bull. 11. *1–61. Pl. 1–2, fig. 1–18.* 1924.—The effect of high temperatures caused by insolation, upon the survival of seedlings of *Pinus strobus* and *P. resinosa* was tested under natural conditions and checked by artificially reproducing similar temperatures. Typical heat lesions on the stems formed at the surface under sustained temperatures of 121–123°F., while a surface soil temperature of 135–142°F. sustained for 30 minutes was fatal to the majority of the seedlings. Surface temperatures of this intensity commonly occur on dry, unshaded surfaces. Moisture, or partial shade of grass or weeds prevents these maxima.—*H. H. Chapman.*

2529. T[revor], C. G. **Growth stagnation due to the clear cutting system.** [Rev. of: Schlich, Wm. **Clear cutting or shelterwood.** Quart. Jour. Forest. 18: 109–124. 1924.] Indian Forest. 50: 432–440. 1924.—In Saxony, up to the end of the 18th century, regeneration was accomplished by the shelterwood method, using mixtures of beech and fir. Later, the clear-cut-and-plant system came into vogue and pure spruce forests resulted. Many of these stands are now showing a decided falling off in rate of growth, the trees are in poor condition, and the ground vegetation has changed materially. This is attributed to soil deterioration and to an exhaustion of the surface soil moisture by the relatively shallow spruce roots. Drought damage is greater in pine than in mixed stands. The tendency now is to return to the original mixed forest. India should adopt the shelterwood system and mixed forests. (See this issue, Entry 2515.)—*E. N. Munns.*

2530. Vallaux, Camille. **The maritime and rural life of Norway.** Geog. Rev. 14: 505–518. 1924.—The forests of the country are briefly described.—*S. B. Show.*

2531. Vaulot, Georges. **Cubages mental des arbres sur pied.** [**Mental estimation of volume of standing trees.**] Bull. Trimest. Soc. Forest. Franche Comté et des provinces de l'Est 15: 262–264. 1924.—Rules are given in verse for determining the volume of the trunks

of broad-leaved species and *Abies pectinata*. The diameter at breast height, in meters, is squared and multiplied by 10 and then corrected by addition or subtraction of small correction factors.—*J. Kittredge, Jr.*

2532. Wainwright, O. F. **Notes on the formation and management of white thorn fences.** Quart. Jour. Forest. 18: 142–145. 1924.

2533.—Weidman, R. H. **Relation of weather forecasts to the prediction of dangerous forest fire conditions.** Monthly Weather Rev. 51: 563–564. 1923.—Relative humidity is valuable as an index of fire-weather conditions, but to know whether the forest fuels will burn and the rapidity with which they will burn, it is necessary also to know their moisture content.—*E. N. Munns.*

2534. Weis, F. **Vore Bögeskove og Hedeplantninger. [Our beech forest and heather plantings.]** Tidsskr. Landokonomi 5: 257–279. 1924.—Beech is the principal forest tree of Denmark. About 50 years ago the government cooperated in planting thousands of acres of heather in Jutland to pine and red spruce. Today a large portion of the land that would otherwise be of little or no value, supports excellent and valuable stands of spruce and pine.—*Albert A. Hansen.*

2535. Weiss, H. F. **Man-made lumber.** Sci. Amer. 130: 250, 296. *3 fig.* 1924.—The manufacture, at Cloquet, Minnesota, of "balsam-wool" and "nu-wood" from saw-mill waste is described.—*Chas. H. Otis.*

2536. White, C. T., and W. D. Francis. **Queensland Trees.** Queensland Agric. Jour. 20: 362. *Pl. 95–96.* 1923.—The field appearance, uses of the timber, and distribution of *Cryptocarya obovata* are outlined.—*W. D. Francis.*

2537. White, C. T., and W. D. Francis. **Queensland Trees.** Queensland Agric. Jour. 20: 434. *Pl. 109, 110.* 1923.—The field characteristics and the uses of the timber of *Euroschinus falcatus* are outlined.—*W. D. Francis.*

2538. White, C. T., and W. D. Francis. **Queensland Trees.** Queensland Agric. Jour. 21: 34. *Pl. 1–2.* 1924.—Some field characteristics and the distribution of *Agathis robusta* are outlined.—*W. D. Francis.*

2539. White, C. T., and W. D. Francis. **Queensland Trees.** Queensland Agric. Jour. 21: 281–283. *Pl. 52–53.* 1924.—The field characteristics, distribution and uses of *Eugenia corynantha* are outlined.—*W. D. Francis.*

2540. White, C. T., and W. D. Francis. **Queensland Trees.** Queensland Agric. Jour. 21: 437–439. *Pl. 89–90.* 1924.—The field characteristics and distribution of *Cryptocarya patentinervis* are outlined.—*W. D. Francis.*

2541. White, C. T., and W. D. Francis. **Queensland Trees.** Queensland Agric. Jour. 22: 26. *Pl. 8, 11.* 1924.—The distribution and some field characteristics of *Beilschmiedia elliptica* and *Araucaria Bidwillii* are outlined.—*W. D. Francis.*

2542. White, C. T., and W. D. Francis. **Queensland trees.** Queensland Agric. Jour. 22: 238–239. *Pl. 75–76.* 1924.—The distribution and field characteristics of *Lucuma amorphosperma* are briefly outlined.—*W. D. Francis.*

2543. Williams, J. C. **Wood is a profitable crop in the South.** Southern Field No. 6. *1–7. 5 fig.* 1924.

2544. Wise, L. E. **Knights of the paper trail.** Amer. Forests and Forest Life 30: 84–88, 114. *5 fig.* 1924.—This is a popular sketch of paper making from early times to the present.—*Chas. H. Otis.*

2545. Wise, L. E. **Spinners of wood.** Amer. Forests and Forest Life 30: 137–139, 182. *6 fig.* 1924.—This is a popular article on some of the products made from wood pulp and the role of the chemist in producing them.—*Chas. H. Otis.*

2546. Wise, L. E. **Twilight of the natural dyes.** Amer. Forests and Forest Life 30: 235–238. *8 fig.* 1924.—Various dyewoods are discussed.—*Chas. H. Otis.*

GENETICS

Orland E. White, *Editor*

(See also in this issue Entries 2125, 2126, 2127, 2131, 2136, 2140, 2147, 2205, 2207, 2211, 2339, 2343, 2345, 2394, 2670, 2672, 2778, 2808, 2813, 2825, 3005, 3006, 3053, 3055, 3103)

2547. Anonymous. **Selected orange and lemon buds.** California Citrograph 10: 60. *2 fig.* 1924.—From 1909 to 1917 the U. S. A. Department of Agriculture expended about $75,000. in establishing the work of bud selection on a permanent basis and distributed approximately 2,000,000 buds to California citrus growers. Since May, 1917, the Fruit Growers Supply Co. has continued the commercial side of this work in furnishing buds cut from high record trees at cost to nurserymen and growers. About 500,000 buds are sold each year, of which 79% go to nurserymen and 21% to orchardists. In order to assure the individual grower that when he buys trees from a nurseryman he is getting Supply Company buds, the nurseries purchasing such buds for resale as trees are required to agree that in the varieties purchased they shall have for sale only stock from buds furnished by the Supply Company. A list of nurseries showing the varieties each one has purchased from the Supply Company is annexed.—*C. S. Pomeroy.*

2548. Anonymous. [Rev. of: Holmes, Samuel J. **A bibliography of eugenics.** Univ. California Publ. Zoology 25: i–iv + 1–514. 1924 (see Bot. Absts. 9, Entry 6560).] Nature 114: 271–272. 1924. (See also Bot. Absts. 13, Entry 7064.)

2549. B., C. A. **Bud selection work in Hawaiian sugar plantations.** Internat. Sugar Jour. 26: 412–416. 1924.—In view of the fact that until recently cultivated sugar cane has been reproduced by planting pieces of the stem, the question as to how the immense number of varieties now growing originated is one for speculation. "All improvements in the character of crop plants ultimately depend on variation, and we are forced to assume that, in the sugar cane and other plants vegetatively reproduced for long periods, there is a constant tendency to vary, by which new forms arise." As one of the most valued characters of cane is richness of juice and as this can be determined only by analysis of the juice after the cane is cut, there are no guiding criteria for determining value when trying to obtain improved varieties by examination of cane stools in the field. The author believes that "the gradual evolution of the splendid varieties which were in general cultivation when the fertility of the cane flower was 1st discovered has been brought about by selection in the field." One character clearly traceable to bud variation is color, and as regards this character a change in the cane plant may be seen to be now taking place everywhere. Striped canes arise in fields spontaneously and not infrequently in fields of one uniform color, and some of these have been traced to outgrowths from single buds. Hawaiian planters are conducting a strenuous campaign to capture such bud mutations of economic value as may occur in the crops of the island. The methods of procedure and the work accomplished along this line by Shamel, Verret, and Paris, as set forth in recent papers by these investigators, are reviewed.—*Nellie E. Fealy.*

2550. Babcock, E. B. **Genetics and plant taxonomy.** Science 59: 327–328. 1924.—Hybridization of species of *Crepis* has brought to light facts which have a bearing on the phylogenetic relationships of the species concerned. Attention is called to the gross morphological variations caused by irregularities in chromosome distribution. Cytological investigations have demonstrated a definite relation between major plant groups and their chromosome groups. These facts from genetics and cytology, the writer believes, must eventually be taken into account if taxonomic treatment is to be useful.—*P. C. Mangelsdorf.*

2551. Babcock, E. B. **Remarkable variations in tarweeds.** Jour. Heredity 15: 133–144. *8 fig.* 1924.—In descendants of 2 forms of *Hemizonia congesta*, when introduced into garden culture, numerous variations appeared, many of which proved to be hereditary. In the 2nd generation of inbred strains there was segregation for size of plant, and it appears that there are numerous factors affecting size and vigor in this species. Similarly, there are several distinct forms or habits of growth, especially in *H. citrina*, some of which are inherited as Mendelian recessives. Variations discovered in color of ligules and stamens were also proved

to be inherited according to Mendelian principles. In flower structure the most striking departures from normal were bilabiate ligules, petallody in ligulate corolla, number of ligule lobes, and length of corolla-tube. Proliferation and virescence appeared both in inbred strains and spontaneously as mutations. The fact that the individual plant is self-sterile, and hence heterozygous, explains the appearance of most of these variations in a wild species under garden culture.—*Author.*

2552. Babcock, E. B. **Species of Crepis.** Science 60: 175–176. 1924.—The species of *Crepis* used by Rosenberg in his paper in Arkiv för Bot. **15,** 1918, was incorrectly determined as *Crepis Reuteriana.* It was *C. capillaris* that was used, as was proved by growing plants from seed of the same strain.—*C. J. Lyon.*

2553. Banker, H. J. **A universal card system for family pedigrees.** Jour. Heredity **14:** 353–358. *5 fig.* 1923.—The unit of this system is a 5 × 8 card on which is recorded the ♂ head of a family, his parents, wife, wife's father, children and their consorts, so arranged as to furnish an interlinking connection with every other similar card in an infinitely expansible system.—*Author.*

2554. Blakeslee, A. F., and J. Belling. **Chromosomal mutations in the Jimson weed, Datura Stramonium.** Jour. Heredity 15: 194–206. *8 fig.* 1924.—In a previous paper, mutants found in *Datura* resembling some of those of *Oenothera* were described. These forms differed from their normal parents by a complex of characters, which was inherited as a whole. Only a fraction of their offspring resembled the mutants, the majority being normals. These differences have been proved due to the possession of an extra chromosome.—Of the other chromosomal mutants, the balanced types have the same number of chromosomes in each of the 12 sets. These include the haploid, triploid, and tetraploid. Those forms with an even number of chromosomes in each set are stable, while those with odd numbers in the sets do not breed true. The tetraploid alone seems to bear the features of a new species. Haploids arise from normals through parthenogenesis. When produced in a cross between 2 species of *Datura,* they resemble only the ♀ parent. Haploids can be used as a source of pure lines; since the diploids they produce, through non-reduction, are completely homozygous.—The differences observable in the diploid plants with 1 extra chromosome will allow a more or less complete survey of the genetic constitution of each of the 12 chromosomes. The similar but smaller differences which may be measured in triploid or tetraploid plants with 1 extra chromosome will aid in this work. Diploids, triploids and tetraploids, with 1 chromosome deficient, have also been found. A table is given in which the number of possible mutants of each kind is contrasted with the number already discovered. The ratios found in the 2nd generation, or in the back-cross, of plants heterozygous in different degrees for any 1 gene, in cases where there are 3, 4, or 5 homologous chromosomes containing the locus in question, differ considerably from the ratios found by Mendel, and afford examples of trisomic, tetrasomic, or pentasomic inheritance.—*John Belling.*

2555. Brink, R. A. **The influence of electrolytes on pollen tube development.** Jour. Gen. Physiol. 6: 677–682. *Fig. 1.* 1924.—Neutral salts in amounts considerably below those commonly employed in culture solutions are very injurious to pollen. Eleven parts per million of NaCl added to sucrose solution reduced the growth of sweet pea pollen tubes 15%. $MgCl_2$ and $BaCl_2$ were found to be about 15 times as toxic. Ca and Mg increased the growth of pollen tubes. The maximum rate of germination of the pollen and the greatest amount of growth of the pollen tubes occurred at pH 6.0 which is considered to be due to the immediate effect of this concentration of H-ions upon the digestion of the reserve food.—*D. F. Jones.*

2556. Castle, W. E. **Genetics and eugenics.** *3rd ed. viii + 434 p., 154 fig.* Harvard Univ. Press: Cambridge, Massachusetts, 1924.—This new edition is divided into 4 sections, instead of 2, as in previous editions. These are: (1) The biological basis of genetics; (2) The historical development of genetics; (3) The essential facts of genetics; (4) Eugenics. Minor changes have been made in most of the material, and such chapters as that on linkage have been practically rewritten. Section 1, comprising 6 chapters, is entirely new, while 3 new chapters are added to the material of section 4. These 3 new chapters deal with the principles of plant breeding, the principles of live-stock improvement, and the relation of Mendelism to mutation and evolution. The appendix of former editions, with the English

translation of Mendel's original paper, has been omitted, but the publishers have arranged to supply this in pamphlet form to those desiring it. An additional bibliographical section of the newer literature has been added and a laboratory manual has been prepared outlining experiments for a ½-year elementary course.—*Orland E. White.*

2557. Castle, W. E. **The genetics of multi-nippled sheep.** Jour. Heredity **15**: 75–85. *2 fig.* 1924.—A study has been made of records kept by Dr. and Mrs. Alexander Graham Bell of sheep breeding experiments extending over a period of 34 years made with the object of producing a multi-nippled and twin-bearing race. It is found that the multi-nippled character is strongly inherited, a close correlation existing between parents and offspring in the number of supernumerary nipples and the degree of their development. Selection is immediately and strongly effective in isolating a multi-nippled race but the original upper limit of variation is with difficulty displaced farther upward. Six-nippled ewes existed in the foundation stock and rarely were individuals obtained subsequently with a larger number of nipples. The best indications of success were obtained by crossing 2 distinct multi-nippled races, a process in which recombination of genetic factors may have occurred. No evidence is found that the frequency of twinning was increased by selection. Environment is found to be a more important factor than heredity as regards twinning. The state of nutrition of the mother at breeding time is probably the chief factor in twinning. This may be conditioned remotely by racial vigor or heterosis, but more immediately by feeding.—*Author.*

2558. Coffman, F. A. **Supernumerary spikelets in Mindum wheat.** Jour. Heredity **15**: 186–192. *4 fig.* 1924.—In 1922, 2 plants of Mindum durum wheat, each bearing more than 1 spikelet at some nodes of the rachis, were found in plots at the Akron Field Station, Akron, Colorado. Progeny of these plants were grown in 1923, and all bore heads having supernumerary spikelets. The spikelets were borne side by side, and not one above another. In some cases 3 complete spikelets were borne at a single node, giving the spikes an appearance similar to that of composite-headed wheats. The supernumerary spikelets were found only in the lower portion of the spikes. Other writers have observed similar variations in common wheat varieties, but their occurrence in durum wheat has not been reported previously. The peculiar variation apparently resulted from mutation, rather than from natural crossing.—*Author.*

2559. Conner, A. B., and R. E. Karper. **Inbreeding grain sorghum.** Jour. Heredity **15**: 299–302. *2 fig.* 1924.—Imbreeding Kafir head selections for 6 and 7 generations resulted in fixing individuality by isolating homozygous forms that were good or bad depending upon hereditary characteristics. Inbreeding did not cause a reduction or an increase in the size of the head or in productiveness except in so far as it isolated strains differing from the parent family.—*A. B. Conner.*

2560. Cook, O. F. **A dragon milliped in China.** Jour. Heredity **15**: 51–53. *1 fig.* 1924.—The article describes an extreme type of variation, showing that evolution is not limited to useful characters. The survival of such a form is explained by the fact that peculiar soil conditions permit the development of characters that would ordinarily be eliminated. The species described, *Hylomus draco*, is so distinct that a new family was necessary to place this form in the system of classification.—*Robert C. Cook.*

2561. Cook, O. F. **Unified cotton communities.** Jour. Heredity **15**: 167–168. 1924.—Attention is called to the fact that pure varieties of cotton cannot be maintained unless every cotton grower in a community raises the same variety. This form of cooperative agriculture is gradually gaining ground in the cotton growing regions of the U. S. A. The production of large quantities of long staple cotton fibre offers many advantages both to the manufacturer and to the user of cotton fabrics.—*Robert C. Cook.*

2562. Cottrell-Dormer, W. **Studies on fertility of sugar cane flowers.** Queensland Agric. Jour. **22**: 248–255. *Pl. 79–82 + 1 unnumb.* 1924.—The paper is illustrated by photomicrographs and drawings of pollen grains, ovaries, stigmas and seed of sugar cane. Experiments in the fertilization of sugar cane flowers are described.—*W. D. Francis.*

2563. Crew, F. A. E. **Complete sex-transformation in the domestic fowl.** Jour. Heredity **14**: 361–362. *1 fig.* 1923.—A Buff Orpington hen, a heavy layer and the mother of

many chickens, from the age of 3½ years progressively developed the sexual characteristics of the ♂. The mating of this bird and a virginal hen yielded 2 chickens. On post mortem examination it was found that the bird was suffering from abdominal tuberculosis which had destroyed the ovary. New growth of germinal tissue occurred and, in the new internal environment this differentiated into spermatic tissue.—*Author.*

2564. Doolittle, S. P. **Comparative susceptibility of European and American varieties of cucumbers to bacterial wilt.** Phytopathology 12: 143–146. 1922.—The resistance of a few American, German, Dutch and French varieties of cucumbers to the cucumber bacterial wilt was compared. It was observed that the foreign varieties were very highly susceptible, an average of over 90% of the plants being attacked. The American varieties were much more resistant, the average number of plants attacked being slightly over 30%.—*George M. Reed.*

2565. Dorst, J. C. **Knopmutatie bij den aardappel. [Bud mutation in the potato.]** Genetica 6: 1–113. 1924.—The question is raised as to whether species propagated vegetatively remain unchanged. The author points out the practical and scientific significance of the problem and arrives at the conclusion that such changes as do occur are not gradual but take place in mutating steps. A discussion of the potato as material for the investigation of such problems leads the author to point out that little is known about the genetic constitution of the potato, that it is greatly modifiable, and furthermore, that the possibility of disease transmission in the vegetative parts and unintentional mixing are both factors which might possibly be mistaken for bud mutation.—In a review of the literature the author catalogues and describes the morphological characteristics of some 78 cases of bud mutation occurring in the potato, some of which have given rise to important agricultural varieties. The experimental data presented give the results of planting eyes from sections of the same potato showing differences in skin pigmentation. It was found that in the main an eye from a blue or yellow region gave rise to blue or yellow skinned tubers respectively in succeeding generations. Other experimental data are presented on the transmission of morphological characteristics, such as size of plant and character of top growth.—The author points out that while the observed cases of bud mutation have been confined to external morphological characters, easily discerned, nevertheless other character complexes such as quality, taste and starch content might also be modified in a like manner.—Several cases of reversion are noted and discussed as to their fundamental explanation.—A commercial variety contains a number of strains arising as bud mutations which differ considerably in their commercial value. Sometimes these variations may be responsible for degeneration and at other times these variations may be of value in constructive selection. It is the latter possibility that leads the author to point out the agricultural significance of bud mutation.—*D. G. Haylett.*

2566. Fraser, A. C. **Heritable characters of maize—XVII. Intensified red and purple aleurone color.** Jour. Heredity 15: 119–123. *1 fig.* 1924.—Certain black colors of the aleurone layer of maize seed are found to be due to a recessive intensifying factor, designated by *in*, which works with the fundamental aleurone color-series *A C R i* and either *Pr* or *pr*. Two kinds of blacks are recognized genetically, one a modification of light red, and the other of light purple. They differ with respect to the *Pr–pr* factors. In both cases the intensification of color is due to the same gene.—*Author.*

2567. Frederikse, A. M. **Rudimentary parthenogenesis in Tenebrio molitor L.** Jour. Genetics 14: 93–99. *1 pl., 1 fig.* 1924.—This is a report of observations on the unfertilized eggs of *Tenebrio molitor* L. These have the power to undergo some slow and irregular development which frequently stops early and is followed by degeneration. Mitosis is often irregular and there is perhaps budding and amitosis.—*J. W. McColloch.*

2568. G., R. R. [Rev. of: Guyénot, Émile. **L'Hérédité. (Heredity).** (Encyclopédie scientifique: Bibliothèque de Biologie générale.) *463 p.* Gaston Doin: Paris, 1924.] Nature 114: 307–308. 1924.

2569. Garber, R. J., and B. L. Wade. **Another instance of defective endosperm in maize.** Jour. Heredity 15: 69–71. *2 fig.* 1924.—A brief description is given of a defective endosperm discovered in a selfed strain of dent corn. The data indicate that the defective endosperm is inherited as a recessive character controlled by a single factor difference.—*R. J. Garber.*

2570. Gates, R. R. **Meiosis and crossing-over.** Jour. Heredity 15: 237–240. 1924.—It is pointed out, in controverting Whiting, that all meiotic phenomena can no longer be fitted into 1 scheme. From the examination of preparations it is concluded that *Batrachoceps* and *Phrynotettix* are parasynaptic, while *Oenothera* is equally clearly telosynaptic. All investigators of meiosis in *Oenothera* are agreed on this point. If the pachynema in this genus was formed after the lateral fusion of parallel threads representing homologous chromosomes, then the later history of the thread shows that the chromosomes would have to divide transversely across the middle to form a chain with nearly the full somatic number of chromosomes arranged end-to-end such as actually occurs. This would not only destroy the chromosome individuality but would also upset the usually recognized basis of Mendelian behavior, which occurs in a few characters in *Oenothera*. Observations show that whole chromosomes, which must be of maternal and paternal origin, are arranged alternately on a single spireme. A denial of telosynapsis in *Oenothera* in order to provide a basis for crossing-over, would therefore involve a denial of chromosome individuality and of a basis for Mendelian behavior. If genetical crossing-over actually occurs in *Oenothera*, and this is regarded as unproved, then it would place the phenomenon in quite a different light. In *Lactuca*, on the other hand, a cytological basis for crossing-over is known to exist.—*Author.*

2571. Getzendauer, F. M. **A hypothesis of "valence" in heredity and evolution.** Amer. Nat. 58: 426–435. 1924.—A discussion is given of the nature of the organization of chromosomes, in which analogies between the characteristics of atoms and species are pointed out, and in which it is suggested that chromosomes may possess the property of valency.—*Lloyd Ackerman.*

2572. Gleisberg. **Zur Frage der Gemüsesaatgut-Anerkennung.** (2nd Beiträg). [**Vegetable seed certification.**] Gartenwelt 27: 145–147. 1923.—This is a discussion of the practicability and desirability of applying to vegetable crops a system of variety testing and seed certification similar to that already practised for the field crops.—*A. J. Mangelsdorf.*

2573. Goldschmidt, R. **Über Vererbung im Y-Chromosome.** [**Inheritance and the Y-chromosome.**] Biol. Centralbl. 42: 481–487. 1922.—The author discusses the general features of inheritance through the Y-chromosome and reviews the evidence which he has obtained from his studies of intersexuality in *Lymantria*, which seems to support the idea that ♀ intersexuality depends upon factors located in the Y-chromosome rather than upon cytoplasmic inheritance. Normally from certain crosses of "weak" females with "strong" males, the F_1 consists of males only, half of which are genetically females ("converted" males). Occasionally exceptional females occur and results from them form the basis for his conclusion that certain sex factors are borne in the Y-chromosome. The author assumes that these exceptional females are produced when a normal female, *XY*, is mated to a non-disjunctional male, *XXY*. Such exceptional females should then be identical with normal females from the reciprocal cross. Mated to F_1 males they gave the same results as females from the reciprocal cross, F_2 consisting of 3 females: 1 male, which agrees with the assumption of the location of sex factors in the Y-chromosome; if cytoplasmic, such females should have given an F_2 of 1 female : 3 males. In crosses of certain "strong" females with "weak" males, the F_2 contains some intersexual males. In this case also exceptional females from the recripocal cross gave the same results. An exceptional ♀ from "weak" female crossed with "strong" male mated to a "strong" male gave equal numbers of normal males and females. This agrees with Y-chromosome localization, but with cytoplasmic localization only male progeny should have been secured. The author also considers the possibility of crossing-over between X- and Y-chromosomes in its bearing on this phenomenon and on apparent cases of non-disjunction, and its relation to sex-limited or sex-controlled characters.—*R. E. Clausen.*

2574. Hance, Robert T. **Heredity in goldfish.** Jour. Heredity 15: 177–182. *5 fig.* 1924.—The number of eggs spawned by goldfish varies from a few hundred to several thousand. Since the eggs from 1 ♀ may be fertilized by several males, these fish offer promising material for the study of inheritance. Unfortunately the cannibalistic tendencies of the offspring interfere seriously with genetic ratios. Such losses may be greatly reduced by removing the larger fish from day to day. The problem of color inheritance is intricate.

Some of the colors are considerably modified by environmental influences. White appears to be recessive to red and black. Double tail and double anal fin are recessive to normal, as are telescope eyes. Ryder's and Tornier's (Tornier's work is reviewed by McBride in The Eugenics Review [London] 15^4, 1924.) theories of the origin of these peculiarities as due to environmental influences are reviewed. It is suggested that a more probable explanation is that these forms, which would be eliminated under natural conditions, have appeared from time to time as mutations, and have been retained by the Japanese and Chinese goldfish breeders.—*Robert C. Cook.*

2575. Hanson, F. B. **The Pratt family: a record of human inbreeding for eight generations.** Jour. Heredity 15: 207–210. *1 fig.* 1924. An old St. Louis family is described in which for 8 generations there has been inbreeding to an unusual degree. The 1st part of the paper deals with the pedigree of this family. The 2nd part treats of the extinction of family lines and the effects of inbreeding on man and other organisms. In the Pratt family no evil effects of long continued inbreeding are apparent.—*Author.*

2576. Hays, F. A. **The tortoiseshell cat.** Jour. Heredity 14: 369–370. 1923.—This is a discussion of color inheritance in cats, and an explanation of why tortoise males are rare, and sterile, the reason being sex linkage with race crossing over between the X and Y chromosomes.—*Robert C. Cook.*

2577. Hein, S. A. Arendsen. **Studies on variation in the mealworm, Tenebrio molitor. II. Variations in tarsi and antennae.** Jour. Genetics 14: 1–38. *19 fig.* 1924.—This paper reports a study of certain variations in the tarsi and antennae of *Tenebrio molitor* which, with few exceptions, are meristic in nature. Particular attention is given to reduced and increased number of joints in the antennae and tarsi, and to variations in the size and shape of the antennial joints. None of these variations were found to be hereditary. Three variations—compressed antennae, antennae and tarsi reduced by 1 joint, and tarsi abnormal—were apparently hereditary and are designated as geno-variations. Strains with these variations breed true and show a monohybrid segregation when crossed with a normal individual. —*J. W. McColloch.*

2578. Hertwig, Richard. **Einfluss der Überreife der Geschlechtszellen auf das Geschlect von Lymantria dispar.** [Influence of overripening of the sex cells on the sex of Lymantria dispar.] Sitzungsber. Bayerisch. Akad. Wiss. Math.-Phys. Kl. 1923^2: 215–252. 1923.—Extensive experiments with this moth failed to show that delaying eggs by means of cold exerts any appreciable control over the sex ratio.—*Leonas L. Burlingame.*

2579. Heuser, Otto. **Untersuchungen über den Anteil der männlichen und weiblichen Hanfpflanzen an der Erntemasse.** [Investigations on the ratio of male to female hemp plants in a mass culture.] Faserforsch. 4: 43–49. 1924.—About equal numbers of ♂ and ♀ hemp plants develop in mass culture but—since the ♂ plants die after blooming while the ♀ plants continue to increase in height, stem thickness and fiber content—the ♀ plants produce a larger proportion of fiber. The fiber of the dry ♂ plants is inferior in quality as well as quantity but not sufficiently so to warrant harvesting before maturity of the ♀ plants. Various methods of selection and breeding for the purpose of reducing the ratio of ♂ plants have not so far yielded important results.—*Charlotte Elliott.*

2580. Hickman, J. E. **The offspring of the Mormon people.** Jour. Heredity 15: 55–68. *6 fig.* 1924.—This article is a detailed statistical study of the offspring of the Mormon people, a comparison of the monogamic offspring with the offspring of polygamic families. The births, deaths, longevity, physical and mental endowments, public attainments, moral development, education, and religious awakening of the 2 groups are compared.—*Author.*

2581. Holmes, S. J. **Studies in evolution and eugenics.** *v + 216 p.* Harcourt, Brace and Co.: New York, 1923.—This is a series of 16 essays on evolutionary theory, eugenics, natural selection, sexual selection, early marriage, birth control, immigration and race mixture.—*C. B. Davenport.*

2582. Hor, Kwen S. **Interrelations of genetic factors in barley.** Genetics 9: 151–180. 1924.—The linkage relations of 10 factor pairs and 1 triple allelomorph series have shown 2 linked groups to be definitely established, with the probability of a 3rd group.—*D. F. Jones.*

2583. Howard, A., and G. L. C. Howard. **Studies in Indian fibre plants. 3. On the inheritance of characters in Hibiscus sabdariffa L.** Mem. Dept. Agric. India Bot. Ser. 13: 47–85. *Col. pl. 1–6.* 1924.—Four varieties of roselle (*ruber, albus, intermedius* and *Bhagalpuriensis*) were found to differ mainly in presence or absence and in distribution of red color in various parts of the plant. Crosses were made, representing all 6 possible combinations. Numerous factors determining presence and distribution of color, were distinguished. Presence of red in most parts depends upon a dominant factor, *R*, *H.s. albus* having the recessive allelomorph. Another factor, *F*, produces red color on the mature calyx and fading corolla (*ruber* and *Bhagalpuriensis*). Distribution of red markings in other parts of *Bhagalpuriensis* is controlled by factor *X*, stated to occur in all 4 varieties although masked, of course, when *R* is recessive. Three additional and independent factors, *A*, *B*, *W*, in combination with *X*, determine the distribution of red markings in *intermedius*. Besides definite markings, various flushes of color occur on stems, determined by factors *S* (always linked with *F*) *M*, P_1 and *N*. Occurrence of 8 additional color factors was indicated. Formulas for the probable genetic constitution of the 4 varieties are given.—*T. H. Kearney.*

2584. Howard, G. L. C., and K. Ram. **Studies in Indian tobaccos. 4. Parthenocarpy and parthenogenesis in two varieties of Nicotiana Tabacum L.—var. Cuba and var. Mirodato.** Mem. Dept. Agric. India Bot. Ser. 13: 1–16. 1924.—The present investigation was undertaken in response to a request by Mrs. R. Haig Thomas who in 1909 first reported widespread parthenogenesis in her investigations in England, using many varieties and hybrids of *Nicotiana*, among them the varieties Cuba and Mirodato. Seed of these 2 varieties and the F_2 hybrid of Cuba ♀ × Mirodato ♂ were obtained from Mrs. Haig Thomas and grown at Pusa from 1921 to 1923. Plants in all stages of flowering were used, and the flowers were treated by the removal of the anthers, or anthers and stigmas. Every precaution was taken to prevent accidental pollination, by sterilization of the instrument used and by the use of parchment bags. In the variety Mirodata, 1185 buds were castrated, representing 43 plants. There was no indication whatever of parthenocarpy or parthenogenesis. In the variety Cuba, 498 buds representing 20 plants were castrated, and 237 capsules were obtained, showing marked parthenocarpy in this variety; no parthenogenetic seed were obtained. The highest percentage of parthenocarpy was noticeably associated with the largest, best nourished plants. In the hybrid Cuba ♀ × Mirodato ♂ from F_2 seed, the plants showed much variability in corolla color, some being pink flowered, resembling the Mirodato parent, some parti-colored or white with pink mottlings, and some with white corollas. The buds on pink flowered plants, following castration showed only slight capsule development or parthenocarpy, and no fertile seed or parthenogenesis. The parti-colored buds showed neither parthenocarpy nor parthenogenesis. In plants with white corollas parthenocarpy and phenospermy occurred, but no parthenogenesis was observed. Where parthenocarpy was observed this was always associated with white corolla color, but not all white buds treated showed parthenocarpy. From the extensive experiments of the authors at Pusa, India, no parthenogenesis whatever was demonstrable in the varieties Cuba or Mirodato or their hybrid, and parthenocarpy was observed only in the variety Cuba and to some extent in the hybrid.—*H. A. Allard.*

2585. Howard, G. L. C. **Studies in Indian tobaccos. 5. The inheritance of characters in Nicotiana rustica L.** Mem. Dept. Agric. India Bot. Ser. 13: 17–37. *Pl. 1–15.* 1924.—In the author's work with the species *Nicotiana rustica*, parthenocarpy and parthenogenesis have never been observed in any of the Indian types. In the inheritance studies, the time of flowering, height, relative length of stamens and pistil, form of the inflorescence, undulations of the leaf margins, were the characters studied. In the time of flowering, the date of the 1st open blossom was the criterion. The F_1 plants were intermediate; the F_2 showed a greater range than the combined ranges of the parents, as did the F_3 generation. The definitely frilled or marginal undulation of the leaves in crosses with the flat margin showed F_1 plants to be intermediate. The F_2 plants gave a 3:1 ratio of undulating to flat margin. In the F_3, plants with flat margined leaves bred true, showing this character to be a simple recessive. Among those with undulating margins some bred true, others showed the F_2 ratio of 3:1 again. In these characters a single factor appears to control the marginal character of the

leaf. In a study of the relative height of the anthers and stigma, plants having the anthers of the flower well below the stigma crossed with plants having the anthers well above the stigma, gave F_1 plants intermediate in this respect, that is, the anthers were just above the stigma. F_2 plants showed every degree of transition between the parents. When plants with the anthers far below the stigma were crossed with plants having the anthers level with the stigma, the F_1 plants showed an intermediate condition, the anthers being just below the stigma. The F_2 plants show both parental types as well as the F_1 hybrid condition. In crosses involving difference in color and in diameter of the calyx, the F_1 plants were exactly intermediate, and the F_2 plants exhibited a range covering the combined range of both parents. This behavior is like that found in *Nicotiana Tabacum*. In crosses involving the character of height of plant, the average of F_1 plants always noticeably exceeded that of either parent, whether the crosses were tall × tall, short × short, or tall × short. This is different from results secured with *Nicotiana Tabacum*, where the F_1 may be intermediate in height. With respect to height in *N. rustica*, length rather than number of internodes is concerned. In the form of the inflorescence, whether open or compact, the F_1 plants show an intermediate condition, but several factors appear to be concerned in the expression. In some manner also the form of the inflorescence is related to the height of the plant.—*H. A. Allard.*

2586. Huxley, J. S. **The variation in the width of the abdomen in immature fiddler crabs considered in relation to its relative growth rate.** Amer. Nat. 58: 468–475. 1924.—The author replotted Morgan's data on the growth of the abdomen in ♀ fiddler crabs, by plotting carapace width:abdomen width, against carapace width, from which he concludes that the differences in abdominal development which Morgan regards as variations toward the ♂ type, in reality represent only a slower relative abdominal growth-rate. Original data from the British shore crab, *Carcinus*, although not presented at this time, assisted the author in arriving at his conclusions. The results from *Carcinus* will be published shortly.—*Lloyd Ackerman.*

2587. Kempton, J. H. **Heritable characters of maize. XVI. Dead leaf margins.** Jour. Heredity **14**: 349–351. *1 fig.* 1923.—The character was first noted in a strain self-pollinated for 2 generations. The margins of the leaves die about the time the plant blossoms. Crosses have been made with a number of well-known aberrant forms, and from this it appears that dead leaf margins are inherited as a Mendelian recessive. The character appears to be unrelated genetically to brachytic culm, ramose inflorescence, sweet endosperm, sun-red plant color, 2 factors for lineate leaves, and yellow leaf spot.—*Robert C. Cook.*

2588. Kihara, Hitoshi. **Cytologische und genetische Studien bei wichtigen Getreidearten mit besonderer Rücksicht auf das Verhalten der Chromosomen und die Sterilität in den Bastarden. [Cytological and genetical studies on the chief species of cereals with special regard to the relation of the chromosomes and sterility in the hybrids.]** Mem. Coll. Sci. Kyoto Imp. Univ. Ser. B. **1**: 1–200. *5 pl., 117 fig.* 1924.—Chromosome numbers of most of the species of *Triticum*, *Aegilops*, *Secale*, *Hordeum*, and *Avena* and their hybrids and forms were determined and the literature on the subject is summarized and discussed. The haploid numbers of the various species of these 5 genera are: *Triticum* (7, 14, 21), *Aegilops* (14), *Secale* (7 or 8), *Hordeum* (7), *Avena* (7, 14, 21). Emmer (14)-wheat (21) (of the spelta group) hybrids (pentaploid) have 35 diploid chromosomes. The heterotypic division of the pollen mother cells of this hybrid show pairing of 14 emmer with 14 wheat (spelta series) chromosomes, thus forming 14 emmer-wheat bivalents, while the remaining 7 of the 21 wheat chromosomes remain unpaired. The reduction phenomena as regards the bivalents are normal, but the 7 univalents or unpaired chromosomes are distributed according to chance among the 4 microspores, making these as to chromosome number $14 + i$, where i = any number from 0 to 7. Sometimes these unpaired chromosomes failed to reach the poles and formed diminutive pollen grains.—The einkorn-emmer series of hybrids (triploid) had 21 diploid chromosomes. The number of bivalents varies from 4 to 7; the number of univalents (unpaired), from 13 to 7. During reduction the bivalents behave normally. *Triticum vulgare-Secale* hybrids (tetraploid) have 28 diploid chromosomes. The number of bivalents is 0 to 3. The heterotypic division is a reduction division for the bivalents. Some of the univalents split lengthwise while others go undivided to the pole. In this hybrid, the heterotypic

division is very irregular. The homotypic division is lengthwise as regards the dyads, while the unpaired univalents often go to the pole undivided. Often there is no homotypic division. From 2 to 6 microspores are formed from a single pollen mother cell.—The chromosome numbers of the F_2 descendants of pentaploid hybrids (emmer-wheat) vary from 28, 29, 30, etc., to 42. The F_2 and F_3 descendants form 2 classes—sterile and fertile—according to their chromosome combinations. The sterile class was either weak or completely sterile. The fertile combinations could be subdivided into 2 classes, namely, those with less (28–34) and those with more than 35 chromosomes (36–42). In succeeding generations, each class becomes more and more modified as to chromosome number, toward 28 and 42 respectively, when constancy is attained. The ratio of these 2 fertile groups, to each other in the hybrids of various wheat species is: *T. durum* × *T. vulgare* (13:5); *T. polonicum* × *T. spelta* (1:3); *T. turgidum* × *T. compactum* (1:6); *T. polonicum* × *T. compactum* (1:5).—Reduction divisions in the embryo-sac-mother-cells of all these crosses show the same chromosome phenomena as were found in the pollen mother cells. The egg and sperm nuclei have the same chromosome numbers. The theoretically expected ratio closely agrees with the experimentally obtained results in the case of the descendants of the fertile combinations of the pentaploid hybrids, that is, descendants of 39-chromosome plants have 39, 40, 41, and 42 chromosome progeny in the experimentally obtained ratio of 8:9:7:1, whereas theoretically the ratio should be 8:12:6:1. No 39-chromosome plant can produce fertile progeny having less than 39 chromosomes. The correctness of Schultz's views on the descent relationships of certain wheat species is borne out by the author's work showing the degree of affinity of the chromosomes in the heterotypic division. The size of the pollen grain depends on the chromosome number; the larger the number, the greater the size. The pollen of the spelta series is the largest. Variability of the pollen grains in F_1 is greater than in the parents. The hybrid descendants in the case of the 28–34 chromosome class (*T. durum* × *T. vulgare*) often have dwarf pollen, formed from spelta series chromosomes. The sterility of the hybrids and the death rate of their descendants is associated with fertile and sterile chromosome combinations. In 36–42 and 29–34 chromosome plants fertility increases with increase or decrease respectively toward 42 or 28, the highest degree of fertility occurring in the constant 42 and 28 chromosome descendants. Plants from sterile combinations show but slight fertility and a high death rate among their descendants. The cause of sterility in the pentaploid (14 + 21 chromosome combination from the emmer-wheat cross) hybrids and their descendants is generally zygotic. Plants breeding true to 40 chromosomes were found among the descendants of the pentaploid wheat hybrid. Those first found were dwarf and lacked 1 pair of the wheat (spelta ser.) chromosomes. One 40-chromosome plant and its true-breeding progeny were half-dwarfs.—The characteristics of the 28-chromosome progeny of the pentaploid hybrid are more or less of the emmer type, while the 42-chromosome types or near types, have wheat (spelta ser.) characters. Twenty-eight and 42 chromosome plants always have the characters of their respective 28 and 42-ancestors. The variation in spike form is closely associated with increase or decrease in chromosome number. Exact duplicates of the original parents were rarely found among the progeny. Speltoid types, representing new combinations were secured from *T. turgidum* × *T. compactum*. The results of reciprocal crosses of 42 and 41 chromosome segragates are described. Crossing results between a fertile and a sterile plant are set forth. A literature list of over 150 titles is appended.—*Orland E. White.*

2589. Krieg, H. **Scheckungsformen argentinischer Pferde. [Types of piebald pattern in Argentine horses.]** Zeitschr. Indukt. Abstamm. -u. Vererb. **34**: 134–139. 1924.—The author calls attention to the difficulty of studying the piebald pattern in horses in Argentina because the piebald horses usually run on large ranges. When they are needed for labor they are rounded up. Those caught are used as long as desired, and again set free on the ranges. Of course the few needed in cities are retained and cared for as horses are kept in other countries. These data were obtained largely by studying the horses retained permanently in industrial centers, with more casual observations on the range herds.—The author describes 2 types of piebaldness, A and B. Type A has white on legs up to knees and hocks or above, and 2 typical patches on the body. One patch is on the croup and may run only from tail setting to hip or may extend up the back and down on the barrel. The other white marking

is in the form of a ribbon occurring over the neck in front of the withers and extending back over the shoulders to the girth. This ribbon may expand into a considerable surface of white. In Type A the face is always white and the region of the hind flanks always pigmented.—Type B differs in having a much larger arc of pigmented surface. The white in this type is confined for the most part to the face, legs and under line of the barrel. The top line is invariably pigmented throughout. In some cases the entire barrel, save 1–2 small blotches near the under surface, is pigmented.—The pigmented surfaces of the Argentine horse may show chestnut, black or bay coat color.—*W. S. Anderson.*

2590. Kulkarni, G. S. **Resistance of sorghum to loose and covered smuts.** Phytopathology 14: 288. 1924.—(For abst. see Bot. Absts. 13, Entry 7850.)

2591. Lehmann, E. **Ueber Sterilitätserscheinungen bei reziprok verschiedenen Epilobiumbastarden.** [Sterility phenomena in reciprocally different Epilobium hybrids.] Biol. Centralbl. 44: 243–254. 1924.—The author had previously reached the conclusion (Zeitschr. Indukt. Abstamm. -u. Vererb. 27: 137. 1922.) that Epilobium hybrids of which *E. parviflorum* is the female parent display a greater degree of sterility than the corresponding reciprocal hybrids of which *E. parviflorum* is the male parent. The present paper is a discussion of the results of Geith (Bot. Archiv. 6: 123. 1924.), which are considered confirmatory of the author's original conclusion, although some exceptions are noted. Geith's results also show the behavior of *E. hirsutum* in crosses to be analogous to that of *E. parviflorum.* It is pointed out that some of Geith's results are in direct contradiction to the "plasma hypothesis" of Renner and Kupper. (Bot. Absts. 12, Entry 4010.)—*A. J. Mangelsdorf.*

2592. Leiby, R. W., and C. C. Hill. **The twinning and monembryonic development of Platygaster hiemalis, a parasite of the Hessian fly.** Jour. Agric. Res. 25: 337–350. *5 pl.* 1923.—This insect develops both monembryonically and polyembryonically. In the latter case there is an average of only 6.31 individuals to each egg produced. These studies were carried out to explain the relation between twinning, the simplest type of polyembryony, and monembryonic development, and to show why about ⅓ of the eggs fail to develop.—In the fall, the eggs are deposited in the eggs of its host where early embryonic development occurs; the latter is completed during the next year, the mature parasite emerging in the fall. The eggs are regularly deposited in groups of 4–8 at each oviposition. Only a part of the eggs contain sperms, and no nucleolus or germ-cell determinant was observed.—Certain rounded or crescentic nuclear masses, termed "paranuclear masses" by Marchal, are found in the nutritive membrane (trophamnion), as has been reported in certain other forms. They arise from the polar bodies, first fusing during the 2nd maturation and then dividing amitotically between the 10th and 12th hours of development. The egg becomes differentiated into an embryonic region and a polar region where the paranuclear masses occur. The eggs are scattered in the host and each becomes surrounded by host tissues which are in part absorbed by the paranuclear mass. Those not surrounded thus by host tissue show retarded development and eventually degenerate.—About the 6th day after oviposition, the embryonic region becomes elongated and divides into 2, each receiving 2 of the 4 embryonic nuclei, and each destined to develop into a larva. The germs become separated and develop independently, each in contact with its own paranuclear mass which continues to increase in size by the absorption of host tissue. They pass through the blastula to the larval stage to 2 larvae, thus explaining twinning.—The mixed broods, that is, of males and females, are explained by the fact that both unfertilized and fertilized eggs are deposited and develop. The authors regard the lack of insemination as somewhat accidental and not controlled.—The embryos later become structurally separated. The trophamnion of each, at first thick, later becomes relatively thinner, due to absorption by the embryo. After wintering in the puparium of the host, the embryonic larva, in the spring, ruptures the thin surrounding membrane and begins to feed actively on the host tissues, pupating in late summer in the host.—*Roger C. Smith.*

2593. Lesley, J. W. **Cross pollination of tomatoes.** Jour. Heredity 15: 233–235. *1 fig.* 1924.—Using the characters, potato leaf and dwarf, as indicators, the percentage of cross-fertilization in 2 tomato varieties planted alternately in adjacent rows in an isolated plot at Riverside, California, was 4.9 for Magnus, a potato leaf variety, but only 0.6 for Dwarf Cham-

pion. The difference is significant and is probably related to a difference in style length, Magnus being long styled and Dwarf Champion short styled. Brief reference is made to the effect of cross-fertilization on a tomato field population and its bearing on selection.—*Author.*

2594. Levy, Joseph. **Studies on reproduction in Amoeba proteus.** Genetics 9: 124–150. 1924.—Granular and raptorial types of *Amoeba* were pedigreed for 40 generations during which time the morphological and physiological characteristics of the 2 types were observed to remain constant, thus confirming Schaeffer's results. The division rate and vitality of the organism are lowered when kept for long periods in the same culture fluid. Environmental changes affected the division rate, but not the periods of high and low reproductive activity. The evidence indicates that polynucleate forms are due to nuclear division unaccompanied by cytoplasmic division.—*Lloyd Ackerman.*

2595. Lindstrom, E. W. **A genetic linkage between size and color factors in the tomato.** Science 60: 182–183. 1924.—Large size of fruit is associated in transmission with the *y* factor for colorless epidermis of the fruit but independent of the *Rr* pair governing the red or yellow flesh color. Linkage is also indicated between the *Yy* factors and number of seed locules and also time of flowering.—*D. F. Jones.*

2596. Lippincott, W. A. **The genealogy of Joseph.** Jour. Heredity 15: 91–92. *1 fig.* 1924.—It is shown that, in the 6th parental generation, Joseph is at least 20.3% inbred. One individual, Terah, appears 6 times in the 4th, 5th and 6th generations.—*Robert C. Cook.*

2597. Löhner, L. **Zur Klärung des Inzuchtproblems.** [**Elucidation of the problems of inbreeding.**] Zeitschr. Indukt. Abstamm. -u. Vererb. 33: 260–263. 1924.— The results of inbreeding and crossing are compared to the responses of organisms to certain chemical stimuli. Some concentrations promote growth while others inhibit development and even cause death. Abnormalities brought to light during inbreeding are believed to be due to an altering of the biochemical specificity such as results from a hyper-normal or sub-normal functioning of certain glands. Crossing, though usually followed by increased vigor, may also result in abnormal development. Improper functioning of the endocrine system in some racial crosses is given as an example of the latter.—*P. C. Mangelsdorf.*

2598. Long, J. A., and H. McL. Evans. **The oestrous cycle in the rat and its associated phenomena.** California Univ. Mem. 6. *1–148. 11 pl., 8 fig.* 1922.—The length of the oestrous cycle in the rat is about 4 days. Its various phases (classified into 4 stages) present correlated histological changes in every portion of the reproductive tract. Ovulation occurs at the height of the oestrus proper, which is 1 of the 4 stages identifiable by the vaginal smears. Corpora lutea average about 10 per ovulation; without pregnancy they show signs of functional inactivity (increasing size of lipoid granules) at the onset of the next ovulation; their total size does not decline until the 3rd oestrus following. Data on reproduction follow: Average litter size is 7; ⅛ of the ova reaching the tubes fail to produce young. Age at 1st ovulation averages 11 weeks with much variation; 1st copulation usually follows 10 days after the 1st ovulation. During pregnancy ovulation is suspended; this is demonstrated by injections of a vital dye (Dianil blue 2R) which colors only active corpora lutea of pregnancy or lactation that are over 4 days old at the time of staining. Bits of stained corpora lutea of pregnancy may be identified as long as 15 days after parturition; during pregnancy the corpora lutea of previous ovulations are profoundly resorbed. Lactation holds off ovulation; removing the young causes changes in lipoid granules within 24 hours. Copulation itself delays the following ovulation, as does the mechanical stimulation of the cervical canal with a glass rod. In this delayed ovulation all the phenomena of early pregnancy are found; and uterine tumors (deciduamata) may be produced if the stimuli are introduced 4 days after the last ovulation. The evidence from the study of these deciduamata, which may be produced during lactation also, is in accord with the view that normal implanation is brought about by a hormone produced by the lutein cells of corpora lutea 4 days old—the time required for the ova to reach the uterus. Excisions of the horns and cervix of the uterus do not modify the cycles. Removal of the ovaries causes complete cessation of all cyclic phenomena. Ovaries transplanted to unusual position in the body will bring about normal cyclic changes in the vaginal epithelium; although no nervous connections are established the mechanical stimulation of the cervix shows the same effect of delaying the next oestrous period as in

animals with normal ovaries. When ovaries from 21-day rats were grown in adults their maturity was accelerated about 2 months.—*E. C. MacDowell.*

2599. Longley, Albert E. **Cytological studies in the genus Crataegus.** Amer. Jour. Bot. **11**: 295–317. *3 pl., 8 fig.* 1924.—(For abstract see this issue, Entry 2336.)

2600. Longley, Albert E. **Cytological studies in the genus Rubus.** Amer. Jour. Bot. **11**: 249–282. *5 pl., 13 fig.* 1924.—(For abstract see this issue, Entry 2337.)

2601. Lotsy, J. P., and K. Kuiper. **A preliminary statement of the results of Mr. Houwink's experiments concerning the origin of some domestic animals. V.** Genetica **6**: 221–282. *Pl. 2–9.* 1924.—Results from crosses of domestic fowl with *Gallus lafayetti*, of birds closely related to bankivas (bankantams) with *G. sonnerati*, bankantams with *G. varius*, and domestic fowl with *G. varius*, are among the data presented.—The conclusions drawn are that hybrids of wild species with domestic birds or birds resembling wild species are fertile in the cases cited; that the results show it to be no longer necessary to consider *G. bankiva* as the sole ancestor of all domestic races of poultry; and that the presence of a greater amount of the characteristics of *G. bankiva* may be explained by its wider distribution showing its greater ability to withstand natural selection in different climates.—*L. W. Taylor.*

2602. Love, H. H., and W. T. Craig. **The genetic relation between Triticum dicoccum dicoccoides and a similar morphological type produced synthetically.** Jour. Agric. Res. **28**: 515–520. *Pl. 1–8.* 1924.—A form similar to Wild Emmer was produced as result of crossing Early Red Chief, a variety of *Triticum vulgare*, and Marouani, a variety of *Triticum durum*. This form was compared with the true Wild Emmer so far as the genetic behavior of the 2 is concerned. The characters studied were fragility of the rachis, color of kernel, color of glumes and form of head. This was done by crossing the 2 types of Wild with Kubanka, a Durum wheat and Black Winter Emmer. In both types of crosses the inheritance of the different characters was the same, whether the true Wild Emmer was used as a parent form or whether the Emmer produced as a result of the cross mentioned was used as the parent form. In all respects as far as the genetic behavior is concerned the 2 forms are identical.—*H. H. Love.*

2603. Lush, J. L. **"Double ears" in Brahma cattle.** Jour. Heredity **15**: 93–96. *2 fig.* 1924.—A peculiar shape of ear occurs among some of the Brahma cattle of the coastal plain of Texas. All animals showing this peculiarity are direct descendants of a single bull imported into Texas in 1906. The increase in the proportion of cattle showing this characteristic furnishes a case in evolution where an apparently useless characteristic becomes widespread.—*J. L. Lush.*

2604. MacBride, E. W. **An introduction to the study of heredity.** *256 p., 36 fig.* (Home Univ. Library) Henry Holt & Co.: New York, 1924.—This volume is written for the lay public and comprises 9 chapters. These are: (1) Introduction; (2) The nucleus as the bearer of the hereditary qualities; (3) The development of the germ into the adult; (4) The inheritance of habits and of their effects; (5) The inheritance of fluctuating variations; (6) The inheritance of "mutations" or "sports"; (7) The inheritance of sex; (8) The causes of mutations; (9) The bearing of the laws of heredity on human affairs. A bibliographical list of 14 selected standard works is appended. Scientific terms are printed in heavy boldface type and defined.—*Orland E. White.*

2605. MacBride, E. W. **Theories of evolution and their application to human affairs.** [Rev. of: Holmes, S. J. **Studies in evolution and eugenics.** *v + 261 p.* Harcourt, Brace & Co.: New York, 1923 (see this issue, Entry 2581).] Nature **113**: 667–669. 1924.

2606. Macomber, D. **The threshold of fertility in rats and its relation to diet deficiency.** Amer. Nat. **57**: 519–531. 1923.—Inbreeding and deficient diets increase the variability in the fertility between individuals. Rats sterile with certain mates may be immediately fertile with others. This led to the hypothesis of relative fertility, by which the product of the fertilities of the 2 animals, calculated from previous history, must be above the threshold for reproduction for them to be productive.—*E. C. MacDowell.*

2607. Marañon, J. M. **A biochemical study of resistance to mildew in Oenothera.** Philippine Jour. Sci. **24**: 369–441. 1924.—Very extensive chemical analyses of the leaves of a number of resistant and susceptible hybrids and elementary species of *Oenothera* to *Ery-*

siphe polygoni were made.—The analyses involved the determination of the total N, including the various forms in which it occurred, the carbohydrates, including sugar, starch, etc., tannin, crude fiber, water-soluble acids and total ash. The resistant strains were found to be higher in tannin and water soluble acids, usually higher in crude fiber and lower in total N and total ash as compared with the susceptible strains. The susceptible strains were comparatively high in the amount of amino acids and nitrogenous compounds of non-basic nature. In the older plants the leaves of the susceptible ones were extremely rich in protein N. The ash of the susceptible plants was high in Ca and S as compared with the resistant plants. These correlations of chemical composition with disease resistance were found in all the strains examined, comprising wild elementary species, reciprocal hybrids and mutations. They were found both before infection and after, indicating that these differences are constitutional.—The author believes that resistance in plants is due to a complex of interacting factors. Those that increase tannin and acid and decrease water soluble nitrogenous compounds tend to build up resistance.—*George M. Reed.*

2608. Metz, C. W. **Additional mutant characters in Drosophila Willistoni.** Jour. Heredity 14: 373–384. *6 fig.* 1923.—This paper supplements a previous one in which 28 sex-linked characters were considered. Six additional sex-linked characters and 23 autosomal characters are described and figured. The latter fall into 2 linkage groups, but linkage data are not given here.—*Author.*

2609. Molhant, A. **L'hérédité de la couleur de la robe chez le cheval. [Heredity of coat color in horses.]** Jour. Soc. Nation. Agric. Belgique 5: 369–370, 378–379. 1923.—The various coat colors of horses are enumerated and the general methods of inheritance, as determined by American investigators, are given. The author attempts to go 1 step further by enumerating a series of factors not only for each color but for shades and markings. He starts with the recessive factor for chestnut, *A*, and adds factors *B*, *C*, *D*, *E*, *F*, *G*, *H*, and *I* as he needs a new gene to account for a change in color pattern. For example, *ABCF* gives the gray coat, *ABCI* mouse grays and *AI* cream chestnuts. The factor *K*, the author states, reduces the pigmentation in the mane and tail; while *L* produces the dappling effect in the coat colors.—*W. S. Anderson.*

2610. Moore, J. S. **Influence of heredity on sex control.** Jersey Bull. and Dairy World 43: 696–697. 1924.—A cow, Louie L., gave birth to 7 females and 3 males. Six of her daughters gave birth to 26 females and 13 males, an indication that a preponderance of females was hereditary; but when a total of the offspring of 6 other generations are added to 26 and 13 the totals become 168 females and 163 males showing that if there was an hereditary tendency to produce an excess of females it was lost in the later generations.—*W. S. Anderson.*

2611. Mussehl, F. E. **Sex ratios in poultry.** Poultry Sci. 3: 72–73. 1923–1924. The sex ratio of 1514 chicks hatched was found to be 52.24% males to 47.76% females. The sex ratios of the 3 breeds studied are as follows: (1) 920 S. C. W. Leghorns 52.72%; (2) 514 S. C. Rhode Island Reds 51.16%; (3) 80 Barred Plymouth Rocks 53.75%. No observable relation was detected between time of hatching and sex ratio. Some data are presented that seem to indicate different sex ratios in the progeny of different males.—*F. A. Hays.*

2612. Nabours, Robert K. **A new dominant color pattern and combinations that breed true in the grouse locusts.** Genetica 5: 477–480. *1 pl.* 1924.—Among 41 elementary color patterns analyzed in the grouse locusts (32 reported), only 1, a striking dominant, is known to have developed (only once) in the laboratory. It has not been found in nature, but has been carried in the laboratory 8 years. New true breeding dominant color pattern complexes have been developed in large numbers. Isolation is required for the perpetuation of the latter but not for the former which constitutes a new type even in the original habitat. Through long distance migrations of the homozygous hybrid complexes (they reproduce also parthenogenetically), and the destruction by drouth, etc., of the originals, new true breeding kinds, including mutants, reoccupy the original areas as they again become habitable.—*Author.*

2613. P., C. **Mendelian studies.** [Rev. of: **Studia Mendeliana: ad centesimum diem natalem Gregorii Mendelii a grata patria celebrandum. (Mendelian studies; for the 100th anniversary of Gregor Mendel.)** *415 p.* Typos: Brunae, 1923.] Nature 114: 305–306. 1924.

2614. Parcot, L. **Greffe de Nicotiana affinis (Tabac blanc odorant) sur Amaranthus caudatus (Amarante Queue de Renard.)** [Grafting of Nicotiana affinis on Amaranthus caudatus.] Bull. Soc. Bot. France 69: 6–7. *1 fig.* 1922.—The author pictures an interesting case of very dissimilar plants grafted together.—*P. A. Young.*

2615. Patel, Maganlal L. **Studies in Gujarat cottons II.** Mem. Dept. Agric. India Bot. Ser. 12: 185–262. *3 pl.* 1924.—This paper deals with a type of *Gossypium herbaceum* L. known as "broach deshi." From comparison of means and modes, in successive generations, of families derived from several selections, it is concluded that hereditary differences exist with respect to the following characters: length of internodes, length of petiole, number of monopodia (vegetative branches), position of 1st fruiting branch, shedding of flower buds and young bolls, earliness of flowering, percentage of 4-celled bolls, weight of bolls, length of lint, weight of seed, and lint index. Positive correlations were found to exist between the following pairs of characters: petiole length and leaf width, weight of seed and weight of lint, weight of seed and length of lint. Detailed descriptions are given of 6 pure strains of broach deshi cotton. The paper concludes with a discussion of the "ideal type" of *Gossypium herbaceum* for the Lower Gujarat region.—*T. H. Kearney.*

2616. Pearl, R., and S. L. Parker. **Experimental studies on the duration of life. IX. New life tables for Drosophila.** Amer. Nat. 58: 71–82. 1924.—Life tables are presented for genetically more homogeneous groups than those presented in the 1st paper of the series. All the curves are also put on an age centile base and compared with the life curves of man, and of the saturniid moth. Theoretical types of life curves are discussed.—*Sylvia L. Parker.*

2617. Philiptschenko, Jur. **Studien über Variabilität. 4. Über die Variabilität der Embryonen. [The variability of embryos.]** Zeitschr. Indukt. Abstamm.- u. Vererb. 34: 121–133. 1924.—Data are presented which show that variability, as measured by the coefficient of variation, is, on the average small in the early embryonic stages, larger in the later stages, and larger still in the mature organism. The organisms studied were an insect *Isotoma cinerea*, and a plant, *Pisum sativum;* 10–20 different characters were measured in 50–100 individuals of each of several stages of development. The identity of the results in these 2 organisms which have so little in common is considered an indication that the conclusion is of general application.—*Sylvia L. Parker.*

2618. Pridham, J. T. **Selection of seed oats.** Agric. Gaz. New South Wales 35: 696–698. *3 fig.* 1924.—Continued selection of the 2 crops, wheat and oats, is recommended. Notes are given upon aberrant variations appearing in varieties of oats.—*L. R. Waldron.*

2619. Rice, Stuart A. **Biological limits in the development of society.** Jour. Heredity 15: 183–185. 1924.—An understanding of the issues between "biological" and "cultural" determinists may be aided by conceiving society as bounded by upper and lower biological limits. Below the lower limits, present forms of society would be biologically impossible. Above the upper limits, forms of society now wholly utopian would be possible because of man's biological evolution.—*Author.*

2620. Richardson, T. C. **The "Pinto" burro.** Jour. Heredity 15: 73–74. *3 fig.* 1924.—Investigation of 2 burros with white and sorrel markings suggests their origin through fertile horse-and-ass hybrids, a combination which was thought to be impossible but which recent evidence leads us to believe sometimes occurs.—*Robert C. Cook.*

2621. Richey, F. D. **Defective seeds in maize—an ancient character.** Jour. Heredity 14: 359–360. *1 fig.* 1923.—Defective grains found in Peruvian graves closely resemble the modern type. Whether this defect has continued for 300 years, or whether it appears from time to time by mutation is problematical.—*Robert C. Cook.*

2622. Riddle, Oscar. **Any hereditary character and the kinds of things we need to know about it.** Amer. Nat. 58: 410–425. 1924.—The identification of the radically diverse aspects necessary to the comprehension of any hereditary character is attempted. Origin, complete ontogeny, foundation in gametes, localization in gametes, intimate nature, and ontogenetic transformability are such aspects. Present studies in heredity and evolution offer mainly a 2-sided attack on a many-sided problem. Some of the present deficiencies can be adequately met only through a wide inter-departmental cooperative effort. Complete ontogeny, intimate nature, and transformability require new and concerted efforts; and on contemporary

students of heredity and evolution, and on laboratories devoted to studies of this subject, rests the responsibility of obtaining this cooperation and of so directing some of their main efforts that these aspects of heredity may properly develop. Our knowledge of heredity will be more advanced by securing all the kinds of facts necessary to an understanding of some 1—any 1—character than by a duplication of much information of a few kinds on many characters. Sex is now 1 favorable character for such a comprehensive study.—*Author.*

2623. Riddle, Oscar. **Sex in the right and left sides of the bird's body.** Proc. Amer. Phil. Soc. 63: 152–161. 1924.—The following 4 main lines of evidence suggest that the 2 points at which the germ glands arise and develop in the bird's body are points unequally favorable for the development of male and female sex glands: (1) The general prevalence of the atrophy of the right ovary; and normally a larger right testis in at least many bird species; (2) the fact that the author has found persistent right ovaries (in various species of pigeons) associated with conditions accentuating femaleness and female production, and the further observation that male pigeons (from wide crosses) which are presumably zygotic females show high proportions of testes with the size relations (larger lefts) of ovaries; (3) the data from hermaphrodite birds have rather uniformly shown a greater proportion of testes in the right than in the left gonad; (4) Benoit's demonstration that following the removal of the left ovary in the young chick, testicular tissue readily develops in the site of the (atrophied) right gonad.—Still other data suggest the same conclusion, and some facts suggest that this inequality is also expressed in several vertebrate groups other than birds. Even a partial explanation of this situation involves the unequal accumulation of primordial germ cells at the sites of the future gonads of bird embryos, as shown by the work of Firket and of Swift. —*Author.*

2624. Ritzman, E. G. **Inheritance of size and conformation in sheep.** New Hampshire Agric. Exp. Sta. Tech. Bull. 25. *1–36.* 1923.—The results on inheritance of size and conformation by crossing Southdown rams with Rambouillet ewes and proceeding with the crossbred offspring on the Mendelian basis of inbreeding, are given in terms of body measurements and ratios between different body measurements in 36 F_1 and 41 F_2, and also in 50 purebred Southdown and 50 purebred Rambouillet ewes. The results are summarized as follows: In a size cross of sheep the mean body measurements of F_1 and F_2 offspring are both between the mean size of the parentage.—Both the relative variability of the mean measurements and the distribution of frequencies of measurements show on the whole a greater range of size in F_2 than in F_1, but neither generation shows sizes that exceed those of either the large or the small foundation parent.—In the proportions of conformation neither F_1 nor F_2 represent the one or the other foundation parent, since both differ from the parentage and they differ from each other.—Since F_2 is on the whole no more variable either in size or proportions than one foundation parent and but little more so than the other, it is reasonable to conclude that its characteristics as a new race or type are as stable as those of its ancestry.— The results obtained here on size inheritance with sheep accord on the whole very closely with those obtained by other investigators on size inheritance with mammals generally. Perhaps the most outstanding feature, in so far as it may throw some light on the practical side of animal breeding, is that observed by Pearson to exist in human beings, by Hatai in albino rats, and by MacDowell in rabbits, namely, that in size crosses different characters do not inherit equally. This phenomenon, together with the generally observed increase of variability in the 2nd cross, accounts no doubt in a large measure for the discredit into which continued inbreeding has fallen in the popular mind, in spite of the fact that the history of our standard breeds shows that these 2 phenomena are the fundamental essentials for the establishment of new breeds or combinations of traits, success or failure depending largely on (1) the most rigid culling of the undesirable elements and (2) the most intensive inbreeding of the selected stock.—*Author.*

2625. Schade, Max. **Variabilitäts und Korrelationsstudien an Wiesenlieschgras. [Variability and correlation studies of meadow grass.]** Jour. Landw. 72: 1–15. 1924.—Four years' breeding of *Phleum pratense* L. is reported and the results are tabulated.—*F. M. Schertz.*

2626. Scheidt, Walter. **Beiträge zur Geschichte der Anthropologie. Der Begriff der**

Rasse in der Anthropologie und die Einteilung der Menschenrassen von Linné bis Deniker. [Contribution to the history of anthropology. The conception of race in anthropology and the classification of mankind from Linné to Deniker.] Arch. Rass. -u. Gesellschaftsbiol. 15: 383–397. 1924.—This section of the history contains an account of Kant's theory of race. This is, in general: the class-distinction of animals of one and the same origin, in so far as this distinction is without exception hereditary. Skin color is such a class distinction; but a family disease, though general, is not universally hereditary, and hence not a racial character.—*C. B. Davenport.*

2627. Schlapp, Max G. **Causes of defective children.** Jour. Heredity 14: 387–397. *6 fig.* 1923.—Evidence is presented to show that some congenital defects in children are caused by the effect of bad environment on the mother acting through her endocrine glands. —*Robert C. Cook.*

2628. Shamel, A. D., C. S. Pomeroy, and R. E. Caryl. **Bud selection as related to quality of crop in the Washington Navel orange.** Jour. Agric. Res. 28: 521–526. *Pl. 1–4.* 1924.—This is the 2nd in a series of reports recording the behavior of progeny trees propagated from different bud variations of the citrus varieties. The present paper deals with a small, yellow-fruited, early-maturing type which shows sunken brown spots on the skin. Two limb variations of this sort were found in 1915 in orchards about 3 miles apart. The trees propagated from these limbs were planted in 1917 and have perpetuated the characters of the parent limbs, while these peculiar characters have not appeared on other limbs in the parent trees. These studies suggest the probability that undesirable strains in established orchards frequently may be due to unintentional propagations from similar limb variations and they emphasize the fundamental importance of careful bud selection in the commercial propagation of citrus trees.—*C. S. Pomeroy.*

2629. Stanton, T. R., and F. A. Coffman. **Natural crossings in oats at Akron, Colorado.** Jour. Amer. Soc. Agron. 16: 646–659. 1924.—Natural crossings varied with the different varieties.—*F. M. Schertz.*

2630. Taylor, William Randolph. **A morphological and cytological study of reproduction in the genus Acer.** Contrib. Bot. Lab. Univ. Pennsylvania 5: 112–138. *Pl. 6–11.* 1920.—(For abstract see this issue, Entry 2347.)

2631. Tracy, Anne. **The origin of the shepherd dog.** Jour. Heredity 15: 146–165. *18 fig.* 1924.—Evidence is presented to show that the shepherd dog, or police dog, is not the product of a wolf-dog cross, but has been developed by slow selection extending back to neolithic times. The shepherd dog has been strictly a utility breed and non-essential "points" have not been stressed. Pedigrees of some of the more famous dogs of the breed are given.—*Robert C. Cook.*

2632. Treboux, O. **Beobachtung von spontaner Fremdbestäubung bei der Erbse. [Observation on spontaneous cross-pollination in peas.]** Zeitschr. Pflanzenzücht. 9: 378–380. 1924.—In contrast to the results of many investigators this writer finds that cross pollination in the common garden pea is by no means rare. A row of a green seeded variety grown among rows of yellow seeded varieties showed many yellow or crossed seed at harvest time, 17.3% of yellow seed being found. It was observed that many insects, including bumble bees, visited the flowers of both types freely.—*P. C. Mangelsdorf.*

2633. Turner, C. L. **Studies in the secondary sexual characters of crayfishes. I. Male secondary sexual characters in females of Cambarus propinquus.** Biol. Bull. 46: 263–276. *2 pl.* 1924.—Nineteen specimens of functional females possessing copulatory hooks, or other secondary characteristics of males were collected in streams around Beloit, Wisconsin. A review of the literature shows that only 13 cases of similar conditions have been recorded for the entire genus *Cambarus*. Two explanations are suggested; namely (1) parasitism of the reproductive organs, and (2) transmission of both ♂ and ♀ secondary sex characters as in the genus *Parastacus*, but in a much less firmly fixed manner.—*Lloyd Ackerman.*

2634. Warth, Gustav. **Über Fuchsien mit verschieden gestalteten Pollen und verschiedener Chromosomenzahl. [Fuchsias with different kinds of pollen and different chromosome numbers.]** Ber. Deutsch. Bot. Ges. 41: 281–285. *Illus.* 1923.—Reciprocal crosses with the genera *Oenothera, Epilobium*, and *Fuchsia* of the Onagraceae may produce different hybrids.

In the former a relation is known to exist between the number of lobes on the pollen and the number of chromosomes. The author found 2-lobed pollen associated with 11 chromosomes (haploid), 3-lobed with 22, and 4-lobed with many chromosomes. Ring shapes were found in diakinesis.—*R. O. Earl.*

2635. Weldon, G. P. **Instability in peach varieties.** Jour. Heredity. 15: 86–90. *3 fig.* 1924.—A mutant variety which originated from the Ontario Cling peach is described. The practical value of knowing the type of fruit and the characteristics of each tree which is used for propagating purposes is stressed.—*Author.*

2636. Wellington, Richard. **Self-sterility and self-fertility of fruit varieties grown in New York.** New York Agric. Exp. Sta. [Geneva] Circ. 71. *1–6.* 1923.—A concise statement is given of the present knowledge of self-sterility and the need for cross-pollination in the principal varieties of fruits—strawberry, bush-fruits, grape, cherry, peach, pear, plum, quince and apple. Some data regarding cross-incompatibility are given for apples, plums, pears and cherries.—*A. B. Stout.*

2637. Wentz, J. B., and R. T. Stewart. **Hybrid vigor in soybeans.** Jour. Amer. Soc. Agron. 16: 534–540. 1924.—Ten crosses between varieties of soy beans showed an increase in height and yield of grain above their parents. Yields of the hybrids ranged from 60 to 394% above the parents. Most of the increase in growth of the hybrids was practically all made in the 3 weeks just previous to maturity.—*D. F. Jones.*

2638. Wettstein, F. V. **Gattungskreuzungen bei Moosen. [Generic crosses in mosses.]** Zeitschr. Indukt. Abstamm.- u. Vererb. 33: 253–257. 1924.—An analysis has been made of the F_1 offspring of the crosses *Physcomitrium pyriforme* × *Funaria hygrometrica* and *Physcomitrium eurystomum* × *Funaria hygrometrica.* The hybrid sporophytes show, in the main, dominance of Physcomitrium characters, with, however, the rust-red capsule color of *Funaria.* A large proportion of the spores are sterile; 117 germinable spores from a capsule of the 1st above-mentioned cross produced gametophytic offspring as follows: 4 died very early; 3 developed only protonemata; 9 were very aberrant forms; 6 were apparently normal univalent races that did not fruit; 9, apparently normal, approximately bivalent, not fruiting; 66, normal univalent, fertile; 20, approximately bivalent, fertile. The results of the 2nd cross mentioned above were essentially similar. The univalent F_1 gametophytes from either cross show predominantly maternal characters. The approximately bivalent F_1 gametophytes range from forms purely maternal in appearance to those showing (in the 1st cross) 3 distinctly maternal and 8 distinctly paternal characters. It is concluded that the antherozoid supplies no cytoplasm, the F_1 sporophyte thus possessing 1 set each of maternal and paternal chromosomes but only maternal cytoplasm. The reduction divisions result in a variously irregular distribution of chromosomes to the spores. Only those spores are viable which contain a complete set of maternal chromosomes, with or without additional chromosomes of paternal origin.—Spores borne by sporophytes resulting from the cross *Physcomitrella patens* × *Funaria hygrometrica* are almost entirely sterile. Four out of 110,000 spores proved viable. From these hybrid sporophytes, however, by regeneration, vigorous $2n$ gametophytes were obtained. These produced $4n$ sporophytes which by regeneration yielded $4n$ gametophytes, and by a repetition of the procedure $8n$ gametophytes were obtained. By fertilization of an egg of a $2n$ hybrid with a univalent Physcomitrium antherozoid, a trivalent (*FPhPh*) sporophyte was obtained, and, by regeneration from this, a trivalent (*FPhPh*) gametophyte. Similarly, the trivalent race *FFPh*, and the quadrivalent race *FFFPh*, were produced. The expression of parental characters varied in accordance with the proportional representation of the parental chromosome groups.—*C. E. Allen.*

2639. Wiebe, G. A. **Albinism in barley.** Jour. Heredity 15: 220–222. *1 fig.* 1924.—Albinism in barley behaves genetically as a simple Mendelian recessive. Albino seedlings die about the time the 3rd leaf starts to emerge. To all appearances starch grains from normal and albino-producing seed are identical. No defective endosperms could be found in either the normal or albino-producing seedlings.—*Author.*

2640. Winkler, H. **Über die Rolle von Kern und Protoplasma bei der Vererbung. [The role of nucleus and cytoplasm in heredity.]** Zeitschr. Indukt. Abstamm. -u. Vererb. 33: 238–253. 1924.—This paper is abstracted by the author from a forthcoming monograph.

He reviews evidences that the carriers of heredity are confined to the nucleus and concludes that at present it does not preclude the possibility of the presence of genes in the cytoplasm. He cites the cases of Baur's antirrhinums and Terao's soja beans as illustrations of characters inherited through the cytoplasm. The object of the paper is to emphasize the importance of the possibility of such inheritance for many characters, particularly the fundamental metabolic processes on which life itself depends.—*Leonas L. Burlingame.*

2641. Wolterech, R. **Über Reaktionskonstanten und Artänderung. [Reaction constancy and species changes.]** Zeitschr. Indukt. Abstamm. -u. Vererb. 33: 297–301. 1924.—The writer cannot explain hereditary variations in *Cladocera* on the basis of definite and stable genes, even though a large number be assumed. He believes that a mistake has been made in attempting to interpret quantitative inheritance on a Mendelian basis. Mendelian factors, he thinks, determine only the "garment" of the organism and may be alike for many species, as are certain factors for coat color in the rodents. Doubling, halving, or eliminating of chromosomes do not change the fundamental constitution of an organism; they merely alter the "garment." The fundamental characteristics of a species which distinguish it from other species are determined, not by definite genes transmitted in a Mendelian fashion but by other means, the nature of which is not yet disclosed.—*P. C. Mangelsdorf.*

2642. Woodruff, Lorande Loss, and E. Lucile Moore. **On the longevity of Spathidium spathula without endomixis or conjugation.** Proc. Nation. Acad. Sci. [U. S. A.] 10: 183–186. *1 fig.* 1924.—One thousand and eighty generations of *S. spathula* were cultured over a period of 444 days without endomixis or conjugation. The culture was terminated by death, but the authors are strongly of the opinion that accidental causes, and not the effects of prolonged multiplication without endomixis or conjugation, were responsible.—The authors conclude that this organism can reproduce indefinitely without recourse to endomixis or conjugation when suitable environmental conditions are supplied.—*Lloyd Ackerman.*

2643. Wriedt, Chr. **The "Gromet" pattern in sheep.** Jour. Heredity 15: 124–126. *2 fig.* 1924.—The character "gromet" in sheep is described. It is due to a color factor that makes the head light gray, mottled with a black design over the eyes, on the bridge of the nose, and on the upper and under lip. The factor is recessive to ordinary white.—*Author.*

2644. Wright, Sewall. **Mendelian analysis of the pure breeds of livestock. I. The measurement of inbreeding and relationship.** Jour. Heredity 14: 339–348. *5 fig.* 1923. **Ibid. II. The Duchess family of shorthorns as bred by Thomas Bates.** Jour. Heredity 14: 405–422. *13 fig.* 1923.—The successive phases of livestock breeding are traced, with particular reference to the methods used by the Collings and Bakewell in improving the native cattle of England. Effects of inbreeding are compared, and it is pointed out that inbreeding results in the fixation of characters by making homozygous a certain hereditary pattern, and does not necessarily lead to deterioration. By a study of the herd books it is proposed to discover just what the early breeders did in terms of modern genetics. To do this it is necessary to apply a measure of coefficient of inbreeding (F), the value of which depends primarily on the number and closeness of the ancestral connections between the sire and dam and secondarily on the degree of inbreeding of the common ancestors of the latter. Examples of the application of this coefficient are given and it is compared with other measures of inbreeding, notably Pearl's, from which it differs widely. The measurement of relationship is also discussed. When the sire and dam are related but not themselves inbred this amounts to twice the coefficient of inbreeding of their progeny.—In the 2nd paper a short history of Bates' breeding methods is given, with comments by his contemporaries as to the results obtained. It is shown that in establishing his famous Duchess family of shorthorns, Bates started with Colling-bred stock already about 40% inbred (that is, 40% less heterozygous than the original shorthorns). For the 8 generations bred he maintained substantially the same level of inbreeding. During these 8 generations a high correlation was maintained with Colling's bull, Favourite. In 40 years this fell gradually from 0.76 to 0.57. These levels of inbreeding and relationship yielded the proper balance between the extreme plasticity of the heterogeneous shorthorn stock and the more complete fixation of characters which would result from closer inbreeding, so that Bates, with his great skill as a judge of livestock, was able to maintain a high degree of vigor and to mold what he considered an ideal type.—*Robert C. Cook.*

2645. Young, C. C. **Asiatic breeds of sheep considered from the standpoint of tail formation.** Jour. Heredity 14: 423-432. *9 fig.* 1923.—Attention is called to the fact that there are no pure breeds of sheep in Asia. The origins of the Karakul fur sheep and of some of the peculiar Asiatic shorttail and broadtail types are discussed.—*Robert C. Cook.*

HORTICULTURE

F. C. Bradford, *Editor*

(See also in this issue Entries 2125, 2126, 2127, 2192, 2264, 2267, 2273, 2313, 2389, 2547, 2551, 2572, 2628, 2632, 2634, 2635, 2636, 2850, 2870, 2877, 2920, 2950, 2967, 2980, 3011, 3014)

2646. Anonymous. **A new white orchid from Panama.** Missouri Bot. Gard. Bull. 12: 53. *Pl. 10–11.* 1924.—*Trichopilia suavis* is described.—*O. T. Wilson.*

2647. Anonymous. **A valuable small flowering tree for St. Louis.** Missouri Bot. Gard. Bull. 12: 93–95. *Pl. 27.* 1924.—*Laburnum anagyroides* is described and illustrated. It has proved hardy in St. Louis.—*O. T. Wilson.*

2648. Anonymous. **Edinburgh conference on the vegetative propagation of plants.** Nature 114: 179. 1924.—This is a brief report upon papers presented at the Royal Garden, July 17 and 18. About 300 species of seed plants and 200 photographs were on exhibition.—*O. A. Stevens.*

2649. Anonymous. **Eremurus for St. Louis.** Missouri Bot. Gard Bull. 12: 41–42. *Pl. 6.* 1924.—*Eremurus robustus* has been grown in the garden with some success under protective measures.—*O. T. Wilson.*

2650. Anonymous. **Forcing grapes.** Missouri Bot. Gard. Bull. 12: 45–51. *Pl. 8–9.* 1924.—Suggestions are given for the cultivation of grapes under glass. Methods are outlined for the control of insect and fungus pests. A list of best varieties for forcing is appended.—*O. T. Wilson.*

2651. Anonymous. **Forcing peaches and nectarines.** Missouri Bot. Gard. Bull. 12: 57–61. *Pl. 12–13.* 1924.—Suggestions are given as to houses, soil, and cultural methods for growing these fruits under glass; also methods for controling pests.—*O. T. Wilson.*

2652. Anonymous. **Frozen hedges and roses and their treatment.** Missouri Bot. Gard. Bull. 12: 37–40. *Pl. 4.* 1924.—Freezing injury to California privet and roses in St. Louis is discussed and suggestions are made for pruning.—*O. T. Wilson.*

2653. Anonymous. **Fruit cultivation in Trinidad and Tobago.** Kew Bull. 1923: 268, 269. 1923.—This article contains general statements about lack of fresh fruits and vegetables in the tropics and the want of attention concerning the cultivation, improvement, and introduction of fruits. Quotations are included from a publication with the title given above, which was issued by the agricultural society of Trinidad in 1922, containing suggestions for the development of crops and finding of a market.—*T. J. Fitzpatrick.*

2654. Anonymous. **Growers see overhead irrigation systems in operation.** California Citrograph 10: 5, 26–27, 32. *11 fig.* 1924.—Statements are given regarding equipment and methods of operating overhead irrigation systems in several citrus and avocado orchards in Los Angeles county. It is claimed that this method of irrigating is more efficient and simpler than the customary method of applying water in furrows or basins. Protection from light frosts and from extremes of heat is anticipated.—*C. S. Pomeroy.*

2655. Anonymous. **Horticultural research.** Nature 114: 332. 1924.—Reference is made to the Annual Report of the National Fruit and Cider Institute, issued at Long Ashton, Bristol.—*O. A. Stevens.*

2656. Anonymous. **La poda de los frutales.** [Pruning of fruit trees.] Defensa Agricola [Uruguay] 5: 52–84. *39 fig.* 1924.—This is a translation and adaptation of Special Bull. 118, Michigan Agric. Exp. Sta.—*J. A. Stevenson.*

2657. Anonymous. **Local oaks and their uses.** Missouri Bot. Gard. Bull. 12: 25–33. *Pl. 2.* 1924.—Oaks of the St. Louis region are discussed as to their characteristics, habits, and uses.—*O. T. Wilson.*

2658. Anonymous. [**The electric fruit counter.**] California Citrograph **10**: 16. *3 fig.* 1924.—This is a description of a new automatic device which counts the number of fruit of each size and grade that pass through the standard fruit-sizing machines. It determines the amount and class of fruit brought to the packing house by each grower and increases the daily output by eliminating certain delays which heretofore have been encountered.—*C. S. Pomeroy.*

2659. Anonymous. **The first exhibition of the American Orchid Society.** Missouri Bot. Gard. Bull. **12**: 61–64. 1924.—This exhibition, held in Boston May 8–11, 1924, marks an "epoch in the annals of American orchidology."—*O. T. Wilson.*

2660. Anonymous. **The maidenhair tree.** Missouri Bot. Gard. Bull. **12**: 64–65. *Pl. 14.* 1924.—A tree in fruit is illustrated.—*O. T. Wilson.*

2661. Anonymous. **The origin of the Granny Smith apple.** Agric. Gaz. New South Wales **35**: 758. 1924.

2662. Anonymous. **Thomas Andrew Knight; a characteristic letter.** Jour. Roy. Hort. Soc. **48**: 232–233. 1923.—This gives a copy of a letter written by Thomas Andrew Knight to Joseph Banks in 1804, accepting membership in the Royal Horticultural Society and expressing the writer's opinions regarding various horticultural questions.—*Frederick V. Rand.*

2663. Anonymous. **What to plant in city gardens.** Missouri Bot. Gard. Bull. **12**: 69–79. *Pl. 15.* 1924.—The problems of planting under adverse city conditions are discussed. A list of trees and shrubs for use in various St. Louis districts is appended.—*O. T. Wilson.*

2664. Anonymous. [Rev. of: Bailey, L. H. (editor). **The cultivated evergreens: a handbook of the coniferous and most important broad-leaved evergreens planted for ornament in the United States and Canada.** *xvii + 434 p. 48 pl., 97 fig.* Macmillan & Co.: London, 1923 (see Bot. Absts. 14, Entry 933).] Nature **114**: 240. 1924.

2665. Anonymous. **Dr. W. P. Kelley discusses the alkali water problem.** [Rev. of: Kelley, W. P. **The present status of alkali.** California Agric. Exp. Sta. Circ. 219. *1–10.* 1920.] California Citrograph **5**: 395. 1920.

2666. Anonymous. **Aphycus, South African parasite for black scale, described.** [Rev. of: Smith, Harry S., and Harold Compere. **The life history and successful introduction into California of the black scale parasite, aphycus lounsburyi How.** Monthly Bull., California State Dept. Agric. **9**: 310–320. *5 fig.* 1920.] California Citrograph **5**: 402. 1920.

2667. Blakeslee, A. F. **Bottle grafting again.** Jour. Heredity **15**: 54. 1924.—It appears that this method, described recently as used with *Datura,* has been independently discovered a number of times before. (See also Bot. Absts. 13, Entry 916).—*Robert C. Cook.*

2668. Booth, C. J. **Irrigation of light gravelly soils.** California Citrograph **5**: 314, 340. 1920.—This is a paper presented at the 1st summer session of the recently organized California Citrus Institute at Santa Ana, June 25, 1920, describing important modifications of customary irrigation practises which have been found better suited to light gravelly soils. The advantages of irrigating in furrows 330 feet long instead of the usual 660 feet are set forth and the need of reducing the interval between irrigations from 30 days to 15, 20 or 24 days is stressed. The impossibility of generalizing for a large section in advising regarding details of operation, is noted.—*C. S. Pomeroy.*

2669. Chung, H. L. **The sweet potato in Hawaii.** Hawaii Agric. Exp. Sta. Bull. 50. *1–20. 7 pl.* 1923.—This bulletin discusses the history of the sweet potato (*Ipomoea batatas*) in the Hawaiian Islands, its culture, soil requirements, place in the customary cropping systems, vine pruning, grading, storing, cost of production, variety tests, insect and fungus enemies, composition, value as feed for animals, and recipes. Terminal cuttings from the vines are customarily used for propagation.—*J. M. Westgate.*

2670. Dallimore, W. **Fruiting of Ginkgo biloba.** Kew Bull. **1923**: 64. 1923.—This is a short note on the fruiting of a tree at Glenfield, Western Park, Bath, England. The tree was planted in 1870 and bore an abundant crop in 1922. This tree stands 400 yards from the nearest male tree and presumably was fertilized by wind-borne pollen.—*T. J. Fitzpatrick.*

2671. Dallimore, W. **Lilac wood (Syringa vulgaris L.)** Kew Bull. **1923**: 240. 1923.—This article describes the wood as of superior quality, and suggests that the wood from the larger bushes may be used for small articles of turnery or for dainty household articles.—*T. J. Fitzpatrick.*

2672. Darrow, George M. **The Chinese bush cherry, Prunus tomentosa.** Jour. Heredity. **15**: 169–176. *6 fig.* 1924.—*Prunus tomentosa* is hardy under colder and more arid conditions than the European species, and is a very promising introduction in the Northern and Northwestern U. S. A. and in Canada. There is great variation in the size, color and flavor of the fruits, but nearly all make excellent jelly. Crosses are reported between *P. tomentosa* and *P. triloba*, *P. besseyi*, and the horticultural varieties Montmerency, Napoleon and Zumbra. All were fertile and showed promise from the breeder's point of view. *Amygdalus davidiana* and *Prunus nigra* have been used successfully as stocks. The seed germinate readily if wrapped in fine wire gauze and planted about a foot deep, in the fall. The seedlings should be transplanted to flats not later than December.—*Robert Cook.*

2673. Florin, Rudolf. **Körsbärsträdens pollinering. Pollination of cherries.** Meddel. Permanenta Kommittén för Fruktodlingsförsök 1. *1–33. Fig. 1–10.* Stockholm. 1924.—This is a treatise on cherry pollination in general, including a review of investigations in America, England, and Holland, an account of cherry pollination in Sweden, a discussion of practical considerations in pollination, notes on the synonomy of cherry varieties, a bibliography of literature, and an English summary. The 8 varieties of sweet cheeries, including Napoleon and Elton, used in pollination studies at Alnarp, southern Sweden, were found to be self-sterile; while 3 sour and Duke varieties were either entirely or partly self-sterile. Morello was found to be self-fertile. A list of varietal crosses giving a high percentage of set is recorded for both Alnarp and the vicinity of Stockholm.—*H. B. Tukey.*

2674. Holland, J. H. **Coffee and Para rubber in Uganda.** Kew Bull. **1923**: 185–188. 1923.—Coffee and Para rubber are cultivated together more or less successfully in Uganda. Three types of coffee are grown. Nearly all the Para rubber in Uganda has been interplanted with coffee bushes. The coffee is productive during a long period before the rubber becomes revenue-producing. However, the intermingling of the crops has frequently led to one or the other being neglected.—*T. J. Fitzpatrick.*

2675. H[olland], J. H. **Dates and date cultivation of the Iraq.** [Rev. of: Dowson, V. H. W. **Dates and date cultivation of the Iraq.** *Pt. 3. 97 p.* W. Heffer & Sons, Ltd.: Cambridge, England, 1923.] Kew Bull. **1923**: 271. 1923.—This short review concerns the appearance of Part 3 of the above noted work, dealing mainly with the varieties of date plums of the Shatt Al'Arab. Descriptions are given of 48 varieties of female palms with a note on the male palms of the region, which are few in number.—*T. J. Fitzpatrick.*

2676. Judd, C. S. **Paper mulch.** Amer. Forests and Forest Life **30**: 345–346. *1 fig.* 1924.—This article describes the system of paper mulch, protected by international patents under the trade-mark "Thermo-Gen," used in pineapple growing in Hawaii.—*Chas. H. Otis.*

2677. Krauss, F. G. **Pineapple Experiments.** Hawaii Agric. Exp. Sta. Rept. **1921**: 52–55. *Pl. 1.* 1922.—A review of 7 years' work with pineapples is given. The red and gray porous soils are best suited to the crop. The black manganiferous soils are very productive if the plants be sprayed with iron sulphate solution. The crop does well from near sea-level to above 1800 feet elevation. Application of humus in any form appears beneficial. Ammonium sulphate gives increased yields, but other commercial fertilizers appear ineffective. Rotations including a green manure crop prove desirable.—*J. M. Westgate.*

2678. McPhee, Douglas. **Fighting the forces of frost at Limoneira.** California Citrograph **10**: 4, 34–35. *6 fig.* 1924.—This is an account of the efficient organization on the largest full-bearing citrus ranch in California, where 10,000 heaters are in readiness to protect about 1500 acres.—*C. S. Pomeroy.*

2679. Metcalf, Woodridge. **Useful and ornamental trees for California ranches and home grounds, Part 2.** California Citrograph **5**: 313, 338–339. *4 fig.* 1920.—This is an evaluation of the various deciduous and coniferous trees which are adapted for ornamental and street planting in California.—*C. S. Pomeroy.*

2680. Paquet, M. Joseph. **L'Inule visqueuse (Inula viscosa).** [**The sticky Inula.**] Bull. Soc. Bot. France **70**: 139–141. 1923.—The author recommends that *Inula viscosa* Dryand be introduced into horticulture because its beautiful, abundant, golden-yellow flowers remain in bloom through September and even later. He lists the species of *Inula* already used in floriculture.—*P. A. Young.*

2681. Pitt, J. M. **Farmers' experiment plots. Vegetable trials, 1923.** Agric. Gaz. New South Wales 35: 729 732. 1924.—Trials were conducted on 3 farms with peas, onions, and tomatoes. Detailed notes are given for certain varieties. The maximum yield of onions was at the rate of 10 tons per acre, secured from the variety Odorless.—*L. R. Waldron.*

2682. Pope, W. T. [**Miscellaneous fruit investigations.**] Hawaii Agric. Exp. Sta. Rept. 1921: 8–26. *Pl. 1–5.* 1922.—A report is given of investigations concerning avocados (composition, classification of varieties, die-back disease), bananas, papayas (propagation by cuttings and grafts, breeding), citrus fruits (historical, breeding), grapes (variety tests), nuts (*Macadamia ternifolia, Pistacia vera, Cocos nucifera*), leguminous fruit trees (*Prosopis* sp., *Ceratonia siliqua, Inga laurina, Tamarindus indica*), and breadfruit (propagation by root cuttings), etc.—*J. M. Westgate.*

2683. Pope, W. T. [**Miscellaneous fruit investigations.**] Hawaii Agric. Exp. Sta. Rept. 1922: 2-8. *Pl. 12.* 1924.—General notes are given on bananas, papayas (*Carica papaia*), citrus fruits, avocados, grapes, strawberries, tomatoes, breadfruit, figs, mangosteen, strawberry guavas (*Psidium cattleianum*), and longan (*Euphoria longana*).—*J. M. Westgate.*

2684. Pope, W. T. [**Miscellaneous fruit investigations.**] Hawaii Agric. Exp. Sta. Rept. 1923: 3 6. 1924.—A brief description is given of work with avocados (pollination and vegetative propagation studies), mangoes (propagation), breadfruit (propagation), bananas (variety tests), papayas (breeding), citrus fruits, grapes, tomatoes and nuts.—*J. M. Westgate.*

2685. Pope, W. T. **The acid lime fruit in Hawaii.** Hawaii Agric. Exp. Sta. Bull. 49. *1–20. 7 pl.* 1923.—The lime was introduced into Hawaii early in the 19th century and seems best adapted of any of the citrus fruits to Hawaiian conditions. The Kusaie variety is considered best. Trees of this variety 4 years old produced 40 pounds of fruit. The West Indian, Rangpur and Tahiti varieties also are valuable. Consideration is given to culture, planting, propagation, composition, commercial products, recipes for using limes, and insect pests and remedies.—*J. M. Westgate.*

2686. Pope, W. T. **The Guatemalan avocado in Hawaii.** Hawaii Agric. Exp. Sta. Bull. 51. *1–24. 19 pl.* 1924.—This bulletin discusses the history of the introduction into Hawaii of the Guatemalan avocado, its nomenclature, characters, propagation (including budding directions), orchard arrangement and management, cultural requirements, harvesting, insect enemies, composition of the fruit, utilization, and descriptions of 17 varieties of promise in Hawaii.—*J. M. Westgate.*

2687. Popenoe, Wilson. **Economic fruit-bearing plants of Ecuador.** Contrib. U. S. Nation. Herb. 24[5]: 101–134. *Pl. 34–49.* 1924.—This paper is based on work carried on in Ecuador by the author for the U. S. Dept. Agric. The introduction, discussing the principal zones of cultivation and their characteristic fruits, is followed by a list of the wild and cultivated fruit-bearing plants, systematically arranged. Under each species are given the vernacular names with the localities where they are used, the range in Ecuador, notes on the general characters of the plant, and a description of the fruit. The plates illustrate 15 of the plants described.—*S. F. Blake.*

2688. Quayle, H. J. **How to avoid injury to young trees in fumigating with liquid gas.** California Citrograph. 5: 322. 1920.—Numerous young citrus trees have been seriously injured or killed by liquid hydrocyanic acid spilled on their trunks in the course of fumigation to combat scale insects. The appearance of the injury on the bark and its effects on the foliage are described. Greater care on the part of fumigators will prevent this trouble.—*C. S. Pomeroy.*

2689. Ripperton, J. C. **Application of the principles of jelly making to Hawaiian fruits.** Hawaii Agric. Exp. Sta. Bull. 47. *1–24, 2 pl.* 1923.—The object of the experiment here described was to develop a systematic procedure for making jelly from any kind of fruit grown in the tropics, provided it contains sufficient pectin and acid. A method is proposed for determining the "pectin number." The principal fruits used were guava (*Psidium guayava*), grape (*Vitis labrusca*), roselle (*Hibiscus sabdariffa*) and poha (*Physalis peruviana*).—*J. M. Westgate.*

2690. Robinson, T. R. **A new method of grafting.** Jour. Heredity 14: 399–404. 8 *fig.* 1923.—The Morris Proximal Slot-Graft, as modified by Barney is described with photographs. The method is of value in grafting nut trees and is coming into use with citrus and

other plants. No wrappings are used, and the entire graft is covered with paraffin.—*Robert C. Cook.*

2691. Sederholm, E. T. **Fundamentals of citrus orchard heating.** California Citrograph 10: 3, 24-25, 28-29. *5 fig.* 1924.—This is a statement, from the engineer's point of view, as to the causes of frosts in California citrus districts, the influence of humidity on the temperature, the mechanics of air heating and the method of determining the heat units and the number of heaters needed for protection from stated low temperatures.—*C. S. Pomeroy.*

2692. St[efănescu], D. I. **Fructele Basarabiei. [The fruits of Bessarabia.]** Bul. Agric. [Bucureşti] 1: 57–96. 1922.—This paper is an abstract from the publications of Moghileanscki, Socolov, Viksne, Cehovici, Abuladze, Aivaz, Fihghendler and Cecherul-Cus on the fruits of Eastern Roumania: Bessarabia. A short description is given of the best apples, pears, plums and some other fruits.—*Al. Borza.*

2693. Stokes, W. B. **Lemon curing test at Gosford.** Agric. Gaz. New South Wales 35: 735–738. 1924.—Lemons were picked under different conditions and given various treatments after picking. Fruit roughly handled when picked and treated as for immediate sale lost 13.4%. Fruit carefully clipped and handled lost but 2.2%. Dipping in copper sulphate solution did not appear to decrease the loss below that in lemons carefully handled and stored without dipping. Heavy loss occurred with lemons dipped in paraffin wax; this is attributed to the cooking effect of the wax. An effort to dissolve the paraffin in gasoline preliminary to treatment was not successful.—*L. R. Waldron.*

2694. Takahashi, J. **Investigations of Washington Navel oranges, comparing the fruits collected from several citrus regions.** Imperial Hort. Exp. Sta. Okitsu, Japan Res. Bull. 2. *1–60. 5 pl., 10 fig.* 1924.—Formosa, Kyushu, Sikoku, the Inland Sea region, and the Pacific Coast of southwestern Hondo constitute the principal citrus regions of Japan. Except in Formosa, the average temperature is 15–17°C.; the annual rainfall, 1200–2300 mm.—In general, the fruit grown in the southwestern part of the Japanese citrus region possesses rich skin color and good flavor; those in the northern part, light color, hard skin and pulp and inferior flavor.—As a result of this investigation it appears that Washington Navel oranges grown in southern Japan have more dilute juice, and less aroma but richer color and better appearance than those grown in California.—*Frederick V. Rand.*

2695. Thompson, R. S. **Improvement of old orange grove by use of green manure crops.** California Citrograph 5: 324, 338. 1920.—A plea is given for the more general use of cover crops in citrus orchards, supported by data showing increased nitrogen content of the top 30 inches of soil in a 30-year old orchard, compared with the virgin soil. Improved soil moisture conditions following the adoption of a cover crop system are presented.—*C. S. Pomeroy.*

2696. Wright, C. H. **The citrus industry in Fiji.** Kew Bull. 1923: 261–264. 1923.—This is a short article on the introduction of the orange and mandarin. The trees appear not to be affected by fungoid diseases and are attacked to a limited extent by mealy bugs and scale insects. The worst pest is the fruit-fly (*Dacus rarotongensis*). Methods of handling fruit to obviate the pest are proposed and have had a limited trial with a view to enhancing export trade.—*T. J. Fitzpatrick.*

2697. Young, Floyd D. **Fruit thermometers in orchard heating for oranges.** California Citrograph 10: 2, 18 19, 23, 44–45, 64. *8 fig.* 1924.—This paper discusses the results of studies by the author for the U. S. Department of Agriculture to determine the temperatures and related conditions under which oranges freeze on orchard trees in California. The records secured indicate that under-cooling of the fruit is likely to occur on cold nights, but the degree of this under-cooling before freezing varies greatly even in different fruits on the same tree, so that in orchard heating practice it is not safe to allow air temperatures to fall below the freezing point of the juice, indicated from 26 to 28.5°F. It is believed that thousands of dollars worth of fuel can be saved during the average fruit season by substituting fruit temperatures for readings made from exposed orchard thermometers when determining the time to light heaters.—*C. S. Pomeroy.*

MORPHOLOGY, ANATOMY, AND HISTOLOGY OF VASCULAR PLANTS

E. W. Sinnott, *Editor*

(See also in this issue Entries 2131, 2345, 2347, 2435, 2488, 2562, 2888, 2889, 2891, 2991, 3004)

2698. Barbaini, Maria. **Sopra la struttura del picciolo e del lembo fogliare dei pioppi in relazione con le proprietà fisiche dei loro legni.** [Structure of the petiole and leaf of poplars in relation to the physical properties of their wood.] Atti Ist. Bot. Univ. Pavia Ser III. 1²: 99–106. *Pl. 6.* 1924.—A comparison is made of the structure of the petiole and leaf of *Populus nigra, P. pyramidalis, P. virginiana, P. carolinensis, P. canadensis,* in contrast to those of *P. alba,* and *P. tremula.* The author concludes that the structure of the leaf of the 1st group favors transpiration and influences the specific gravity and other properties of the wood and that there is a correlation between the mobility of the leaf, which decrease the shock of the wind on the branches, and the inelastic quality and the wood.—*P. D. Caldis.*

2699. Bugnon, P. **Sur l'évolution du concept de phyllorhize.** [The evolution of the concept of the phyllorhiza.] Bull. Soc. Bot. France 70: 837–842. 1923.—This is a statement of Chauveaud's theory of the phyllorhiza. The phyllorhiza is a miniture plant in which one easily recognizes 2 distinct parts: one, directed upward, showing the form and the coloration of a leaf; the other, directed downward, having the form and coloration of a root.—*P. A. Young.*

2700. Chauveaud, Gustave. **Le protoxyleme centripète est toujours primaire. Le soi-disant protoxylème centrifuge est souvent secondaire.** [The centripetal protoxylem is always primary. The so-called centrifugal protoxylem is often secondary.] Bull. Soc. Bot. France 70: 426–431. *Pl. 3–4.* 1923.—The author describes conditions in *Parietaria officinalis* and *Picea excelsa* and presents arguments for the above stated conclusion.—*P. A. Young.*

2701. Dallman, A. A. **Gagea lutea Ker. and its parasite.** Naturalist 1924: 240. 1924.—No seed formation could be detected during April and May among some hundreds of plants growing in a long known station near Doncaster. Many bulbils were forming and the plants appear to be largely if not entirely propagated vegetatively. Teleutospores of *Uromyces Gageæ* Beck. were plentiful.—*W. H. Burrell.*

2702. Dauphiné, André. **Polystomie, polystélie et accélération vasculaire dans les racines traumatisées.** [Polystomy, polystely, and vascular acceleration in injured roots.] Bull. Soc. Bot. France 70: 502–508. *Pl. 7–9.* 1923.—The author pictures and describes these conditions in *Faba vulgaris* and *Amygdalus communis.*—*P. A. Young.*

2703. Dauphiné, André. **Sur l'interprétation d'une structure anomale dans une racine traumatisée d'Amygdalus communis.** [The interpretation of an anomalous structure on a wounded root of A. communis.] Bull. Soc. Bot. France 71: 171–172. 1924.—(See also preceding entry.)

2704. Daveau, J. **Phyllostachys aurea Rivière. Sa floraison à Montpellier.** [The blooming of P. aurea at Montpellier.] Bull. Soc. Bot. France 69: 232–236. *5 fig.* 1922.—The floral structures of this bamboo are illustrated and described.—*P. A. Young.*

2705. Francis, W. D. **The development of buttresses in Queensland trees.** Proc. Roy. Soc. Queensland 36: 21–37. *Pl. 1–6, fig. 1–7.* 1924.—The paper deals with the distribution of buttressed trees in the Queensland and extra-Australian floras, the stage of growth at which the buttresses appear, their transition from roots, their structure, shape and dimensions, the extent to which root and stem respectively contribute to them, and the possible causes through which they arise. It is shown that buttresses are well established in young trees of several species when they have attained $\frac{1}{17}$–$\frac{1}{19}$ of their maximum stem diameter and $\frac{1}{4}$ of their maximum height. In all large, prominently buttressed trees a decided diminution was observed in the size of the axis of the tree from above the buttresses towards its insertion in the soil. It is computed that in *Tarrieta argyrodendron* the roots alone contributed to the construction of the buttresses in trees up to 20 cm. in stem diameter, and that in subsequent development the stem performs a large part in building up the buttresses. High relative humidity, the absence of much direct sunlight on the soil surface, the humus content of the upper layer of rain-forest soil, negative geotropism and phototropism are suggested as possible originating or contributing agents of or toward the formation of buttresses.—*W. D. Francis.*

2706. Gagnepain, F. **Déhiscence des fruits et germination du Dimerocarpus Brenieri Gagnep.** [Dehiscence of the fruits and germination of D. Brenieri G.] Bull. Soc. Bot. France 70: 204–207. 1923.—The structure of the fruit, the dehiscence and germination of the seed are discussed in detail.—*P. A. Young.*

2707. Gravis, A. **Gametophore et sporophore.** [Gametophore and sporophore.] Bull. Soc. Bot. France 69: 59–65. 1922.—A general consideration of the comparative morphology of these organs is given.—*P. A. Young.*

2708. Guérin, Paul. **Le genre Biflora; étude anatomique du Biflora radians Bieb.** [Anatomical study of B. radians.] Bull. Soc. Bot. France 70: 481–487. *Fig. 1–5.* 1923.—This is an illustrated discussion of the anatomy of this species.—*P. A. Young.*

2709. Guérin, Paul. **Les Urticées: cellules à mucilage, laticifères et canaux sécréteurs.** [The Urticaceae: mucilaginous cells, lactiferous and secretory canals.] Bull. Soc. Bot. France 70: 125–136, 207–215, 255–263. *Fig. 1–15.* 1923.—The author describes the structures given above, as well as raphides, in sections of stems and leaves in many genera of the Urticaceae.—*P. A. Young.*

2710. Holden, H. S., and Dorothy Bexon. **On the seedling structure of Acer pseudoplatanus.** (Abstract) Rept. British Assoc. Adv. Sci. 1922: 397. 1923.

2711. Kühnholtz-Lordat, Georges. **Emploi de l'acide lactique dans les recherches anatomiques.** [Use of lactic acid in anatomical researches.] Bull. Soc. Bot. France 69: 9–10. 1922.—The author describes a method of preparation of Lacto-Sudan III and its use with *Teucrium*, *Vinca*, *Rubia*, teliospores of *Puccinia malvacearum*, and pollen grains of *Libocedrus*. He also describes a lacto-iodine preparation.—*P. A. Young.*

2712. Noachovitch, Georges. **Au sujet d'un "Faux-Cacao."** [A false cacao.] Bull. Soc. Bot. France 70: 418–425. *Fig. 1–17.* 1923.—This is a description and discussion of material received in a shipment from South America which was used to adulterate the true cacao, *Theobroma Cacao.*—*P. A. Young.*

2713. Nobécourt, Pierre. **Étude sur les organes souterrains de quelques Ophrydées de Java.** [Study of the subterranean organs of some of the Ophrydaceae of Java.] Bull. Soc. Bot. France 69: 226–231. *Fig. 1–3.* 1922.—The figures show the tubercle formation and the division of the stele in *Platanthera angustata.*—*P. A. Young.*

2714. Pearsall, W. H., and F. A. Mason. **Yorkshire naturalists at Holme-on-Spalding Moor, and at Ravenscar.** Naturalist 1924: 269–278. 1924.—The report has field notes on plant galls, bryology, ecology and lichens.—*W. H. Burrell.*

2715. Perrot, Em., et G. Hubert. **Sur quelques particularités histologiques que l'on observe dans le pétiole et la feuille des Verbénacées.** [Some histological peculiarities in the petiole and leaf of the Verbenaceae.] Bull. Soc. Bot. France 69: 70–75. *Fig. 1–6.* 1922.—The figures and descriptions show the fragmentation of the vascular arcs.—*P. A. Young.*

2716. Priestley, J. H. **The endodermis: a study in causal anatomy.** (Abstract) Rept. British Assoc. Adv. Sci. 1922: 400. 1923.

2717. Reed, E. L. **The peanut plant.** Science 60: 478. 1924.—The blossoms of *Arachis hypogea* were so poorly understood by earlier writers that they were said to be dimorphic, some fertile and some sterile. They are actually complete, self-fertilized, papilionaceous blossoms though many modern publications have copied the errors of the earlier writers.—*C. J. Lyon.*

2718. Reynier, Alfred. **Le Chenopodium ambrosioides Auctorum, polycarpien, étudié en son double stage de développement.** [The polycarpelous C. ambrosioides studied in its double stage of development.] Bull. Soc. Bot. France 69: 293–299, 378–385. 1922.—This is a detailed description of the development of various forms of *Chenopodium.*—*P. A. Young.*

2719. Schoute, J. C. **The foliar origin of the internal stelar structure of the Marattiaceae.** (Abstract) Rept. British Assoc. Adv. Sci. 1922: 402. 1923.

2720. Smith, R. W. **Staining woody tissues with safranin and picro-anilin blue.** Science 59: 557–558. 1924.—Good differentiation of microtome sections is obtained by the use of these stains which are made up separately. The safranin should be used as equal parts of saturated solutions of the water-soluble and alcoholic-soluble safranin. To make the picro-anilin stain, mix saturated solutions (in 95% alcohol) of picric acid and anilin blue in the ratio

of 78% of picric acid to 22% of anilin blue. The complete schedule is to rinse the sections in 50% alcohol, cover with safranin for 2 hours, de-stain to a light pink in 50% alcohol, stain for 2 hours in the picro-anilin blue, wash 10 seconds in absolute alcohol, clear in clove oil and mount in balsam.—*C. J. Lyon.*

2721. Soar, I. **The structure of the endodermis in some gymnosperm leaves.** [Abstract] Rept. British Assoc. Adv. Sci. 1922: 394–395. 1923.

2722. Souèges, René. **Développement de l'embryon chez le Geum urbanum L.** Bull. Soc. Bot. France 70: 645–660. *Fig. 1–47.* 1923.—A detailed illustrated description of the development of the embryo in *Geum urbanum* is given.—*P. A. Young.*

2723. Souèges, René. **Développement de l'embryon chez le Myosotis hispida Schlecht.** Bull. Soc. Bot. France 70: 385–401. *Fig. 1–43.* 1923.—The embryonic development of *Myosotis hispida* Schlecht. is described and figured in detail.—*P. A. Young.*

2724. Souèges, René. **Recherches sur l'embryogénie des Solanacées.** [**Researches on the embryology of the Solanaceae.**] Bull. Soc. Bot. France 69: 163–178, 236–241, 352–365, 555–585. *Fig. 1–259.* 1922.—This is a detailed description of the embryology of the Solanaceae, well illustrated with figures of different types of embryos.—*P. A. Young.*

2725. Thompson, J. McLean. **The meaning and evolution of some floral characters.** [Abstract.] Rept. British. Assoc. Adv. Sci. 1922: 396. 1923.

MORPHOLOGY AND TAXONOMY OF ALGAE

E. N. Transeau, *Editor*

L. H. Tiffany, *Assistant Editor*

(See also in this issue Entries 2276, 2302, 2320, 2329, 2355, 2361, 2367, 2372, 2373, 2375, 2387, 2402, 2424, 2937, 2977, 2987, 3023, 3024, 3034)

2726. Anonymous [Summary of the paper by: Burton, J. **A method of staining and mounting algae, desmids, etc.** (In: **Proceedings of the Quekett Microscopical Club.** Jour. Quekett Microscopical Club. Jour. Quekett Microsc. Club 2nd Ser. 15: 19–49.)]. *P. 45–48.* 1923.—Materials were fixed in 1/10–1/4% chromacetic for about 24 hours, washed 24 hours, changing the water every 2 hours, stained with very dilute Hoffman's Blue in 25% glycerin, infiltrated with glycerin, and mounted in cement cells on slides.—*L. B. Walker.*

2727. Anonymous. [Summary of the paper by: Harris, G. T. **Fixing and staining algae.** (In: **Proceedings of the Quekett Microscopical Club.** Jour. Quekett Microsc. Club 2nd Ser. 15: 19–49.)] *P. 48.* 1923.—Various methods are noted.—*L. B. Walker.*

2728. Buen, Odon de. **Croisiere de la Giralda (1920–1921).** [**Cruise of the Giralda (1920–1921).**] Bull. Inst. Oceanograph. Monaco 445: 1–15. 1924.—This is a tabular arrangement of observations made by this Mediterranean vessel, chiefly in regard to depth, temperature, and chemical contents of the water. Some mention is made of the plankton and seaweed genera observed.—*T. C. Frye.*

2729. Cedercreutz, Carl. **Finnländische Zygnemalen.** [**Finland Zygnemales.**] Acta Soc. Fauna et Flora Fennica 55²: (1–7). *Fig. 1–4.* 1924.—The author lists 29 species and varieties of Zygnemales from South Finland: *Spirogyra* 18, *Zygnema* 3, *Debarya* 1, *Mougeotia* 7. *Spirogyra fennica* n. sp., *S. subsalina* n. sp., and *S. reticulata* Nordst. var. *regularis* n. var. are described as new.—*L. H. Tiffany.*

2730. Deflandre, Georges. **Contribution à la flore algologique de la Haute-Savoie.** [**Contribution to the algal flora of Haute-Savoie** (Upper Savoy?).] Bull. Soc. Bot. France 70: 898–914. *Fig. 1–6.* 1923.—The article consists of a classified list of the algae collected, with brief notes on most of the species.—*P. A. Young.*

2731. Deflandre, Georges. **Emploi de la nigrosine dans l'étude des Algues inferieures.** [**Use of nigrosin in the study of lower algae.**] Bull. Soc. Bot. France 70: 738–741. 1923.—The author gives the details of staining lower (small) algae with nigrosin.—*P. A. Young.*

2732. Denis, M. **Observations algologiques dans les Hautes-Pyrenees.** Rev. Algologique 1: 115–126. 1924.—The excursions reported were made in the central region of Bagneres-

de-Bigorre and in the Cauterets. An outline of the special localities is given. There are listed 18 Myxophyceae, 53 Bacillarieae, 1 Flagellata, 94 Chlorophyceae and 1 Rhodophyceae. New to France are: *Diatomale hiemale* var. *maximum* Meist; *Synedra vitraea* var. *distorta* Meist.; *Ceratoneis arcus* var. *linearis* Holmboe; *Pediastrum Boryanum* var. *longicorne* f. *capitata glabra* R. Fischer; *Penium Libellula* var. *interruptum* W. & G. S. West; *Cosmarium moniliforme* var. *panduriformis* (Authur?); *Staurastrum spinosum* Ralfs; and *S. turgescens* DeNot. (To be continued.)—*Wm. Randolph Taylor.*

2733. Gard, Médéric. **Recherches sur une nouvelle espèce d'Euglène (Euglena limosa nov. spec.).** [Researches on the new species: E. limosa.] Bull. Soc. Bot. France 69: 184–196, 241–250, 306–313. *2 fig.* 1922.—The following section headings will indicate the content of this article: The species in the genus *Euglena*, method of life of algae, the parenchymatous state, action of different reagents on the movements of *E. limosa*, cultures in different media, effect of different regions of the spectrum on the rhythmic movements of *E. limosa*, and division (fission) in *E. limosa.*—*P. A. Young.*

2734. Gard, Médéric. **Sur l'état sexuel du Fucus ceranoides L.** [The sexual state in F. ceranoides L.] Bull. Soc. Bot. France 70: 294–296. 1923.—The author has observed many specimens and concludes that this species is dioecious.—*P. A. Young.*

2735. Goor, A. C. J. van. **Les Algues marines de la Hollande.** [The marine algae of Holland.] Bull. Soc. Bot. France 70: 629–636. 1923.—The species of algae of Holland are listed. A discussion of their distribution is given.—*P. A. Young.*

2736. Griffiths, E. M. **Phytoplankton of Hornsea Mere.** Naturalist 1924: 245–247. 1924.—This contains some notes on plankton taken Sept. 12, 1922.—*W. H. Burrell.*

2737. Grubb, Violet M. **Notes on the reproduction of certain members of the Rhodophyceae.** (Abstract) Rept. British Assoc. Adv. Sci. 1922: 402–403. 1923.

2738. Hamel, G. **Quelques Cladophora des côtes françaises.** [Certain Cladophoras of the French coast. (To be continued).] Rev. Algologique 1: 168–174. 1924.—The difficulties encountered in a study of this genus are outlined and the 1st part of an organized descriptive classification is given. Longiarticulatae, including *Cladophora pellucida* (Huds.) Ktz. and *Cladophora prolifera* (Roth.) Ktz. are discussed here.—*Wm. Randolph Taylor.*

2739. Hustedt, F. **Bacillariales aus Innerasien gesammelt von Dr. Sven Hedin.** [Bacillariales from Central Asia collected by Dr. Sven Hedin.] In: (Hedin, Sven. **Southern Thibet.** Stockholm. Vol. 6, No. 4.) *P. 105–152. Pl. 9–10.* 1920.—The data for the stations and the distribution of the genera through the surrounding regions are given. The following are described as new: *Cyclotella lacunarum; C. thibetana; Fragillaria asiatica; Achnanthes pamirensis; A. Hedini; A. pinnata; Neidium rectum; N. mirabile; N. punctulatum; N. didelta; Pinnularia Hedini; P. tibetana; P. subborealis; P. fonticola; Navicula subrhombica; N. Hedini; Stauroneis laticeps; Gomphonema Hedini; Cymbella tibetana; Amphora Ostenfeldi, A. geniculata; Nitzschia Ostenfeldi; N. gradifera; N. bacillariæformis; N. pseudolinearis; N. subvitrea; N. bacillum; N. regula; Pinnularia divergentissima* var. *capitata; Navicula viridula* var. *Pamirensis; Hantzschia amphioxis* var. *compacta;* and *Nitzschia frustulum* var. *asiatica.*—*Wm. Randolph Taylor.*

2740. Issatchenko, B. **A propos de deux cas de reproduction en masse de Cyanophyceae.** [Two cases of mass reproduction in Cyanophyceae.] Rev. Algologique 1: 104–106. 1924.—The Bourg-du-Midi near Otchakov shows yearly, usually toward the middle of August, a "bloom" principally of *Microcystis flos-aquae* (Wittr.) Kirchn. In the Caspian Sea in September, 1918, on a trip to Tcherny-Rynok a very dense "bloom" of *Aulosira* was noted.—*Wm. Randolph Taylor.*

2741. Leblond, E. **Algues du littoral septentrionale du Golfe d'Ajaccio (Corse).** [Algae of the northern shore of the Gulf of Ajaccio (Corsica).] (To be continued.) Rev. Algologique 1: 156–161. 1924.—A list is given of 61 Florideae and 28 Phaeophyceae.—*Wm. Randolph Taylor.*

2742. Мейер, К. И. [Meyer, K. I.] **Материалы по флоре водорослей оз. Байкала.** [Materials for an algal flora of Lake Baikal.] Журнал Московского Отделения Русского Ботанического Общества [Jour. Moscow Sect. Russian Bot. Soc.] 1: 1–27. *10 fig.* 1922.—In a systematic study of the algal flora of the Lake Baical, 4 new species of *Draparnaldia* and

1 new species of *Chaetomorpha* are recognized. The new *Draparnaldia* species are: *D. baicalensis, D. simplex, D. Goruschankinii* and *D. arenaria;* the new species of *Chaetomorpha* is named *C. baicalensis.*—*Ernst Artschwager.*

2743. Offner, Jules. **Communication d'une lettre de M. James Groves sur la découverte en France du Tolypella hispanica Nordst.** [A letter from James Groves on the discovery of Tolypella hispanica Nordst. in France.] Bull. Soc. Bot. France 70: 77–79. 1923.—Grove found this member of the Characeae near the island of Giens.—*P. A. Young.*

2744. Oye, Paul van. **Biologie et écologie du phytoplancton d'un lac tropical.** [Biology and ecology of the phytoplankton of a tropical lake.] Bull. Soc. Roy. Bot. Belgique 56: (1–19). 1924.—The results of a study of the phytoplankton of Lake Gedeh ("Sitoe Gedeh") in Java, given by months for the year 1919, include the color of the water, its temperature, the prominent macroscopic flora, and the occurrence of the phytoplankton. A list of the latter, comprising 94 species and varieties, was made up of Myxophyceae 13, Diatomaceae 30, Chlorophyceae 14, Flagellata 22, Sarcodineae 10, and Infusoria 5. The plankton presents an annual periodicity, both qualitative and quantitative. At the beginning of the rainy season an increase in plankton, especially in Diatomaceae and Chlorophyceae, is noted. From July to September, inclusive, the phytoplankton is rich both in species and in individuals; from October to June, inclusive, there are relatively few species and individuals. In January and February, there is a predominance of Myxophyceae and Flagellata; February to April, Ciliates; May and June, practically no plankton; July to September, diatoms and flagellates; October and December, Crustaceae and ciliates.—*L. H. Tiffany.*

2745. Pascher, A. **Zur Homologisierung der Chrysomonadencysten mit den Endosporen der Diatomeen.** [The homology of the chrysomonad cysts with the endospores of diatoms]. Arch. Protistenk. 48: 196–203. *4 fig.* 1924.—Scherffel disputes Pascher's contention that the endospores of diatoms, the spores of Heterokontae, and the cysts of chrysomonads are homologous structures, because (1) in *Monas* and other forms the plug is not silicified and (2) the plug is developed later than the cyst wall. The 1st argument is not valid, for in both chrysomonads and diatoms there is great variability in the silicification, and in some chrysomonad cysts treated with sulphuric acid there is an undestroyed remnant of the plug left. The 2nd argument is also not valid, for in diatom spores, also, the under part develops before the cover, never simultaneously with it. There are transition conditions in chrysomonad spores where the plug is a plate under a wider pore than in most, and also the plug always fits inside of the spore wall, as does the cover in diatom spores. In an appendix, Pascher states that his earlier contention that cyst-building in chrysomonads is sometimes atypical, not endogenous, must be abandoned, for later investigations show that it is always endogenous.—*Harold Kirby.*

2746. Pavillard, J. **A propos de la systématique des Péridiniens.** [Classification of Mediterranean phytoplankton.] Bull. Soc. Bot. France 70: 876–882, 914–918. *Fig. 1–2, A–C.* 1923.—Much of the discussion deals with *Ceratium* spp.—*P. A. Young.*

2747. Pavillard, J. **Le Coscinodiscus gigas Ehrb. et ses congeners.** [C. gigas and related forms.] Rev. Algologique 1: 97–103. *2 fig.* 1924.—It is indicated that the 2 valves of individuals of a Coscinodiscus showed notable differences in the areolation and the development of a central hyaline area, and that while by one type of valve these specimens would pass for *C. gigas* Ehrb., the other type indicated another species. It is suggested that a revision of the species distinctions is necessary.—*Wm. Randolph Taylor.*

2748. Pavillard, J. **Pronoctiluca et Nocticula.** Bull. Soc. Bot. France 69: 365–370. 1922.—The author gives a detailed discussion of these 2 flagellate genera.—*P. A. Young.*

2749. Pratje, Andre. **Die verwandschaftlichen Beziehungen der Cystoflagellaten zu den Dinoflagellaten.** [Relation of the cystoflagellates to the dinoflagellates.] Arch. Protistenk. 42: 422–438. *8 fig.* 1921.—The systematic position of the cystoflagellates, especially *Noctiluca*, has been a difficult one to define. Recently, and especially by Kofoid (1920), relationship to the Dinoflagellata has been traced. In dinoflagellates there is a transverse and a longitudinal furrow, with a flagellum in each. Processes comparable to a tentacle are found in certain forms. A vestigial transverse furrow was found in young *Noctiluca*, and the "tooth" at the proximal end of this furrow was homologized with the transverse flagellum. These

homologies, however, are doubtful. The tentacle appears to be a pseudopodial structure, and is not a specific character for the genera and families possessing it. The "tooth" is very doubtfully homologous with the transverse flagellum, and the small furrow is probably not a rudiment of the girdle. Likewise, the flagellum of *Noctiluca* can hardly be said to represent a longitudinal flagellum. According to Doflein's system of classification of flagellates, the holozoic food habit would place the Cystoflagellata far from the Dinoflagellata. It seems best until more is known to retain Haeckel's order, Cystoflagellata, for the 3 genera *Noctiluca*, *Leptodiscus* and *Craspedotella*.—*Harold Kirby.*

2750. Puymaly, A. de. **Le Chlorococcum humicola (Naeg.) Rabenh.: Quelques cas de fecondation. [Fertilization in Chlorococcum humicola.]** Rev. Algologique 1: 107–114. 1924. —It is indicated that the *Cystococcus humicola* of Naegeli is a *Chlorococcum* Fries, that the gonidia of *Xanthoria* called *Cystococcus humicola* by Famintzin and Barenetzky are a *Trebauxia* Puym., that the *Cystococcus* of d'Hedlund belongs to a *Prasiola* and that the *Cystoccus humicola* of DeGerneck is probably a *Dictyococcus* Gerneck. *Chlorococcum* Fries was clearly defined by Atari in 1892. In its reproduction by zoospores it differs from forms which it superficially resembles. A culture established from rich material in January, 1922, gave abundant zoospores. Dehiscence occurred generally in the early morning; the motile cells were actively and positively phototropic. Fertilization was observed in 3 cases, and in 2 the cells were somewhat unequal. The motility continued somewhat abated during fusion. A resemblance to the condition in *Chlorochytrium Lemnae* and *Endosphaera biennis*, endophytic forms, is indicated.—*Wm. Randolph Taylor.*

2751. Raphelis, A. **Additions à la flore des algues de Cannes. [Additions to the algal flora of Cannes. (To be continued.)]** Rev. Algologique 1: 162–167. 1924.—A list of 2 Myxophyceae, 20 Chlorophyceae and Heterokontae, and 15 Phaeophyceae is given.—*Wm. Randolph Taylor.*

2752. Reuling, Fritz. **Zur Morphologie von Trichomonas vaginalis Donne. [On the morphology of Trichomonas vaginalis Donne.]** Arch. Protistenk. 42: 347–363. *Pl. 15, 4 fig.* 1921.—*T. vaginalis* was found in the vaginal secretion of 20% of the 250 women examined. The only successful culture medium was Ringer's solution plus "Ascites" acidified with a few drops of 1% acetic acid. The organism could be kept alive in this for 7 days, daily subcultures being made and kept at 37°. The body is pyriform, becoming globular after a time, and is markedly metabolic. There are 4 equal flagella, instead of 3 as hitherto described, which would place this, the type of the genus, in the genus *Tetratrichomonas* Parisi. There is an undulating membrane arising from a basal granule. The axostyle is finely pointed and may protrude from the protoplasm. Binary fission, and multiple fission forming 4 individuals was observed. At the anterior end of the body is a basal granule from which the fibrillar structures arise. Beneath the undulating membrane is a strongly refractive rib or costa which functions as a supporting organ. The axostyle consists of 4 fibrils. In the basal body are probably basal granules belonging to the 5 flagella. The supporting fibrils of the 4 free flagella form the axostyle, that of the undulating membrane the rib. The hyaline axostyles of other trichomonads may be fundamentally fibrillar in structure. The nucleus possesses a "Binnenkorper" surrounded by a clear peripheral zone, and numerous granules of peripheral chromatin. A rhizoplast has not been certainly made out. A tubular parabasal apparatus is present within the axostyle fibrils. In division, a centrodesmose appears between the divided basal granules; flagella, undulating membrane and rib are reconstructed; the old axostyle disappears and new ones grow. Encystment was not observed.—*Harold Kirby.*

2753. Scherffel, A. **Über die Cyste von Monas. [Monas cysts.]** Arch. Protistenk. 48: 187–195. *6 fig.* 1924.—The cyst membrane of *Monas vulgaris* is silicified, as evidenced by the brittleness and by the results of treatment with concentrated H_2SO_4, which destroys the contents but leaves the cyst wall unchanged. This fact, together with the structure of the cyst, indicates that certain colorless flagellates, as *Monas* and *Anthophysas* are really colorless chrysomonads. Pascher's contention for the 2-shelled structure of the chrysomonad cysts as adducing evidence for the relationship of the Bacillariaceae, Heterokontae and chrysomonads, regarding the plug as silicified and representing the 2nd shell, is disproved by the H_2SO_4 treatment, for the plug is completely destroyed. Also, the plug is developed later than

the cyst wall. The relationship of these groups, however, has better support than this.—*Harold Kirby.*

2754. Sjöstedt, Gunnar. **Om Prasiola cornucopiae J. G. Ag. och Prasiola stipitata v. Suhr. samt deras förhållande inbördes.** [**Prasiola cornucopiae and P. stipitata—their relation to each other.**] (Résumé in German.) Bot. Notiser **1922**: 37–45. *Fig. 1–31.* 1922.—The author had found numerous intermediate forms, and regarded *P. cornucopiae* as a reduced form, due to biological factors, such as less dampness, reduced salinity, and changed nutrition conditions. He also regarded *P. calophylla* (Carm.) Menegh. the same as *P. cornucopiae.*—The literature list has 16 entries.—*P. A. Rydberg.*

2755. Stekhoven Jr., und J. H. Schuurmans. **Die Teilung des Trypanosoma brucei Plimmer u. Bradford.** [**Division in T. Brucei.**] Arch. Protistenk. **40**: 158–180. *Pl. 13–14.* 1919.—Division is promitotic, with the construction of a division spindle composed of motor and generative elements. The blepharoplast lies in the wall of a vacuole, in which is also the basal granule. These 2 divide by simple constriction, not simultaneously. The blepharoplast is not a kinetic nucleus, but is probably a sensory organ governing the motions of the flagellum. The system of blepharoplast, basal granule, flagellum and undulating membrane gives rigidity to the body. The 2nd flagellum arises by outgrowth from the new basal granule.—*Harold Kirby.*

2756. Tuttle, Albert H. **The reproductive cycle of the Characeae.** Science **60**: 412–413. 1924.—The study of a new species of *Nitella* whose antheridium possesses longitudinally divided quadrants, has lead to a cytological study of this and other genera of the Characeae. The plant body is in the diploid phase and reduction divisions have been located in the early stages of both the oogonium and the antheridium. Well-fixed material of *Chara, Tolypella* and dioecious *Nitella,* showing the formation of reproductive organs, is desired from collectors who care to further this study.—*C. J. Lyon.*

2757. Wille, N. **Algen aus Zentralasien gesammelt von Dr. Sven Hedin. Algae collected by Dr. Sven Hedin in Central Asia.** (In: Hedin, Sven, **Southern Thibet.** Stockholm. Vol. 6, no. 5.) *P. 155–195. Pl. 11.* 1922.—Lists of species previously reported from this area are given. A considerable list from the present expedition is given together with date, locality and morphological data. The following are described as new: (1) *Merismopedium convolutum Breb.* f. *minor; Chamaesiphon incrustans* f. *asiatica;* f. *longissima; Oscillatoria tenuior* var. *asiatica;* **Hedinella** n. gen. *H. pamirica; Rhizoclonium hieroglyphicum macromeres* Wittr. f. *inflata;* (2) *Merismopedium hyalinum* Kg. f. *salina; Oscillatoris brevis* Kg. f. *variabilis; Cosmarium Broomei* (Thw.) Ralfs f. *rotundata; Spirogyra affinis* (Hass.) Petit f. *tibetica.*—*Wm. Randolph Taylor.*

MORPHOLOGY AND TAXONOMY OF BRYOPHYTES

Alexander W. Evans, *Editor*

(See also in this issue Entries 2276, 2302, 2353, 2397, 2401, 2402, 2418, 2427, 2638, 2714, 3034)

2758. Bartram, Edwin B. **A variety of Grimmia anodon.** Bryologist **27**: 59. 1924.—The author briefly describes *Grimmia anodon* Bry. Eur. var. *anomala* Bartr, a proposed new variety from the Tucson Mountains, Arizona.—*E. B. Chamberlain.*

2759. Bartram, Edwin B. **Two new Grimmias from Arizona.** Bryologist **27**: 60–64. *Pl. 10, 11.* 1924.—The author proposes as new and figures the following mosses from Southern Arizona: *Grimmia santa-ritae* with the forma *propagulifera,* a relative of *G. pennsylvanica* Schwaegr.; and *G. catalinensis* with the var. *mutica,* related to *G. ovata* Schwaegr. The authority for the new names is Bartram.—*E. B. Chamberlain.*

2760. Britton, Elizabeth G. **The mosses of El Yunque.** Bryologist **27**: 64–65. 1924.—The author gives a running account of the more conspicuous mosses, both genera and species, that are found in the tropical rain forest near the summit of El Yunque, Porto Rico. No detailed list is included.—*E. B. Chamberlain.*

2761. Cavanagh, Lucy M. **Notes on the genus Catharinaea in Iowa.** Proc. Iowa Acad. Sci. 28: 223–224. 1921.—Of the 2 species of *Catharinaea* listed from Iowa, *C. undulata* (L.)

W. & M. is fairly constant, while *C. angustata* Brid. is subject to considerable variation, the leaves being sometimes smooth and sometimes more or less papillose. The distinctly papillose forms seem to be referable to *C. Macmillani* Holz., characterized by papillose leaves, but since this character is inconstant the author suggests that Holzinger's species might be reduced to varietal rank and "stand as *C. angustata* var. *Macmillani* (Holz.)."—*H. S. Conard.*

2762. Dixon, H. H. **New species of mosses from the Malay Peninsula.** Bull. Torrey Bot. Club 51: 225-259. *Pl. 3-4.* 1924.—The new mosses here described are based on material collected by H. N. Ridley and others in various parts of the Malay Peninsula. Some of the specimens came from the Mitten Herbarium at the New York Botanical Garden, some from the Kew Herbarium, and others from the Singapore Botanical Garden. The species and varieties proposed as new are the following, Dixon being the authority, unless otherwise noted: *Acanthocladium polymorphum, Acroporium aciphyllum, A. albidissimum, A. complanatum, A. denticulatum, A. leucophyllum, A. longicuspis* (Broth.) n. sp. (based on *Sematophyllum longicuspis* Broth. ms.), *A. malayanum, A. obscurum* (Broth.) n. sp. (based on *S. obscurum* Broth. ms.), *A. Ridley, A. rigens dicranolomoides* (Broth.) n. var. (based on *S. dicranolomoides* Broth. ms.), *A. serrulatum, A. surculare, Braunfelsia longipes, Calymperes constrictum, C. stenophyllum, Chaetomitrium perakense* Broth., *C. setosum* Broth., *Clastobryum prionotrichum* (Hampe) n. sp. (based on *Hypnum prionotrichum* Hampe ms.), *Ctenidium falcifolium, Dieranoloma brevicapsulare, D. perintegrum, Ectropothecium callichroides elongatum* n. var., *E. Moritzii stereodontoides* n. var., *E. siamense, E. singapurense, Endotrichella plano-marginata, Fissidens amblyotis, F. subdiscolor, Macromitrium magnirete, Myurium subnitens, Pinnatella lingulata, Syrrhopodon elimbatus, S. lingulifolius, S. pungens, S. perakensis, S. Ridleyi* Broth., *Taxithelium bilobatum, T. instratum Kurzii* n. var., *T. isocladioides, T. subtrachaelophyllum, T. trachaelophyllum* (C.M.) n. sp. (based on *Hypnum trachaelophyllum* C.M. ms.), *Thysanomitrium abbreviatum, T. Ridleyi, Trichosteleum albifolium,* and *T. brachypelma compactum* n. var. Each species is accompanied by data regarding stations and collectors and also by critical remarks. In addition a note on *Calymperes setifolium* Hampe is given, and the characters of the genus *Acroporium* Mitt. are discussed. Most of the new species and varieties are figured.—*P. A. Munz.*

2763. Dixon, H. N. **The student's handbook of British mosses. With illustrations and keys to the genera and species by** H. G. Jameson. *3d ed. 8 vo. xlviii + 582 p. Pl. 1-63.* V. V. Sumfield: Eastbourne, 1924.—The 1st edition of this popular manual was published in 1896 and the 2nd in 1904. The text of the 3rd edition is essentially like that of the 2nd, except for a few changes, the most important of which are noted below. It therefore retains the same system of classification and the same extensive recognition of subspecies. In the introductory portion the morphology of mosses is briefly described, a glossary of bryological terms is supplied, an artificial key to the genera is given, and the system of classification is briefly outlined. The mosses are 1st divided into the 3 subclasses Sphagnales (1 order, 1 genus, 12 species), Andreaeales (1 order, 1 genus, 4 species) and Bryales, the last subclass being subdivided into the groups Nematodonteae and Arthrodonteae. In the 1st group 3 orders are recognized: Tetraphidaceae (1 genus, 2 species), Polytrichaceae (3 genera, 15 species), and Buxbaumiaceae (2 genera, 3 species). In the 2nd group a subdivision into the 2 subgroups Apolepideae and Diplolepideae is made, the Apolepideae including the following orders: Dicranaceae (7 tribes, 19 genera, 72 species), Fissidentaceae (2 genera, 16 species), Grimmiaceae (7 genera, 37 species), Tortulaceae (3 tribes, 10 genera, 80 species), and Encalyptaceae (1 genus, 5 species). The Diplolepideae are 1st divided into the Diplolepideae Acrocarpae and Pleurocarpeae, the Acrocarpae including 8 orders, as follows: Orthotrichaceae (4 genera, 31 species), Schistostegaceae (1 genus, 1 species), Splachnaceae (4 genera, 9 species), Funariaceae (6 genera, 16 species), Meesiaceae (4 genera, 6 species), Timmiaceae (1 genus, 2 species), Bartramiaceae (5 genera, 13 species), and Bryaceae (8 genera, 63 species). The Pleurocarpae include the following: Fontinalaceae (1 genus, 3 species), Cryphaeaceae (1 genus, 1 species), Neckeraceae (2 genera, 5 species), Hookeriaceae (3 genera, 3 species), Leucodontaceae (6 genera, 7 species), Leskeaceae (8 genera, 19 species), and Hypnaceae (14 genera, 118 species). Full descriptions are given of all species and higher groups, and each species is accompanied by critical remarks, together with data on distribution in the British Isles. The following

mosses, not mentioned in the 2nd edition are here recognized as British: *Barbula glauca* (Ryan) Dixon (based on *Didymodon glaucum* Ryan), as a subsp. of *B. cylindrica* Schp.; *B. Nicholsoni* Culmann, as a subsp. of *B. rigidula* Mitt.; *Bryum pallens* var. *europhyllum* D. A. Jones; *B. rufifolium* Dixon (based on the untenable *B. rubicundum* Stirt.), as a subsp. of *B. capillare* L.; *Campylopus setifolius* var. *intermedius* D. A. Jones; *Catharinea angustata* var. *rhystophylla* (C. M.) Dixon (based on *C. rhystophylla* C. M.); *Fissidens algarvicus* Solms; *Grimmia retracta* Stirt., as a subsp. of *G. Hartmani* Schp.; *Heterothecium Macounii* Best, as a subsp. of *H. heteropterum* (Bruch) B. & S.; *Orthothecium intricatum* var. *abbreviatum* Dixon; *Philonotis caespitosa* (a subsp. of *P. fontana*) var. *adpressa* Dismier; *Pterogonium gracile* var. *harlecense* D. A. Jones; *Tortula norvegica* Wahl., as a subsp. of *T. ruralis* (L.) Ehrh.; *Trichostomum crispulum* var. *viridulum* (Bruch) Braithw.; and *T. limosella* (Stirt.) Dixon n. comb. (based on *Barbula limosella* Stirt.), as a subsp. of *T. flavovirens* Bruch. On the other hand the 3 following mosses, recognized in the 2nd edition are omitted for various reasons: *Hypnum circinale* Hook., *Philonotis fontana* var. *pumila* (Turn.) Dixon, and *Tortula inermis* Mont. (a subsp. of *T. subulata* (L.) Hedw.). The following changes of taxonomic interest may likewise be noted: *Cynodontium Jenneri* Stirt., a subsp. of *C. polycarpum* (Ehrh.) Schp., replaces subsp. *C. laxirete* (Dixon) Grebe; *Ditrichum vaginans* Hampe is transferred, as a subsp., from *D. tortile* (Schrad.) Lindb. to *D. homomallum* (Hedw.) Hampe; *Grimmia subsquarrosa* Wils., with the var. *edinensis* Braithw., is reduced to a subsp. of *G. trichophylla* Grev.; *Hypnum decipiens* (De Not.) Limpr. replaces *Thuidium decipiens* De Not.; *Philonotis adpressa* Ferg. is reduced from a subsp. of *P. fontana* (L.) Brid. to var. *adpressa* (Ferg.) Loeske & Moenk.; and *Ulota vittata* Mitt. replaces *U. calvescens* Schp. The numerous figures on the half-tone plates have all been redrawn.—*A. W. Evans.*

2764. Györffy, I. **Beiträge zur Kenntnis der Anatomie von Archidium phascoides Bridel. [Contributions to our knowledge of the anatomy of Archidium phascoides.]** Acta Litt. ac Sci. Univ. Hungaricae Francisco Josephinae **1**: 127–129. *Pl. 6.* 1924.—The author's observations on the rare *Archidium phascoides* are based on material collected by L. Loeske in Westphalia. After a brief account of the histological structure of the stem and midrib, the capsule in an almost mature condition is described. At this stage the columella has disappeared, and little is left of the capsule wall except the epidermis, the enclosed cavity being filled with the large spores, 148μ in diameter. The spore wall consists of a thin exospore and a thick endospore except in the region of the germ-pore (first described by Leitgeb), where the endospore is thin and bulges inward, thus leaving a lenticular space between the 2 layers.—*A. W. Evans.*

2765. Lowe, Rachel L. **Collecting mosses on Mt. Ktaadn, Maine.** Bryologist **27**: 57–59. 1924.—The author spent 2 weeks in camp near the foot of Mt. Katahdin, Maine, and collected mosses as occasion offered. No list is given but about a dozen of the more interesting species are mentioned in a running account of the various excursions made. There are no new records for the State.—*E. B. Chamberlain.*

2766. Stephani, Franz. **Species Hepaticarum.** Vol. 6. *P. 369–432.* 1923.—The author in the present installment of this extensive work (see Bot. Absts. 13, Entry 7803, and 14, Entries 506 and 507) completes his treatment of the genus *Mastigophora*, describing 3 additional species, and takes up the following genera in the indicated sequence, the number of species described being indicated in each case: *Ptilidium*, 1; *Lepidolaena*, 3; *Trichocolea*, 16; *Ptychocoleus*, 1; *Lopholejeunea*, 3; *Anoplolejeunea*, 1; *Brachiolejeunea*, 4; *Marchesima*, 1; *Dicranolejeunea*, 6; *Cyclolejeunea*, 1; *Prionolejeunea*, 5; *Harpalejeunea*, 6; *Strepsilejeunea*, 8; *Drepanolejeunea*, 2; *Leptolejeunea*, 3; *Ceratolejeunea*, 2; *Taxilejeunea*, 14; *Macrolejeunea*, 1; *Otigoniolejeunea*, 3; *Hygrolejeunea*, 5; *Euosmolejeunea*, 1; *Pycnolejeunea*, 3; *Cheilolejeunea*, 6; *Eulejeunea*, 7; *Microlejeunea*, 3; *Leptocolea*, 2; *Megaceros*, 3; *Aspiromitus*, 2; *Anthoceros*, 17; and *Dendroceros*, 5. He then begins an appendix to the entire work, describing 7 species of *Aneura* and 1 of *Petalophyllum*, these 2 genera having already been considered in the early pages of the volume. The geographical distribution of the various species described is as follows: Asia, 30; Africa, 11; tropical North America, 16; South America, 50; Pacific Islands (including Australia), 39. The following species are apparently described for the 1st time, Stephani being the authority unless otherwise indicated: *Aneura Augustae* (New Guinea), *A. Hunsteinii* (New Guinea),

A. latemultifida (New Guinea), *A. Ledermannii* (New Guinea), *A. rotangicola* (New Guinea), *A. subledermannii* (New Guinea), *A. subtenerrima* (New Guinea), *Anthoceros alpinus* (India), *A. Arsenii* (Mexico), *A. caucasicus* (Caucasus), *A. Chevalieri* (Central Africa), *A. confusus* (Jamaica), *A. Esquisolii* (China), *A. Gottschei* (Guadeloupe), *A. grosse-involucratus* (India), *A. Jackii* (India), *A. Milbraedii* (Cameroons), *A. Moukeyanus* (Jamaica), *A. Nordenskjoldii* (Japan), *A. notothyloides* (India), *A. parvus* (Mexico), *A. speciosus* (Chile), *A. subalpinus* (China), *Aspiromitus aberrans* (Hawaii), *A. appendiculatus* (Samoa), *Brachiolejeunea appendiculistipa* (Bolivia), *B. columbica* (Colombia), *B. sulcata* Evans (Jamaica), *Ceratolejeunea aberrans* (East Africa), *C. Ledermanii* (New Guinea), *Cheilolejeunea hamata* (New Hebrides), *C. mexicana* (Mexico), *C. Rechingeri* (Samoa), *C. Wattsiana* (Australia), *Cyclolejeunea dentistipula* (Dominica), *Dendroceros cucullatus* (Philippine Islands), *D. ecuadorensis* (Ecuador), *D. elegans* (Java), *D. hawaicus* (Hawaii), *D. pusillus* (New Caledonia), *Dicranolejeunea japonica* (Japan), *Drepanolejeunea decurviloba* (New Guinea), *D. Riddleana* (New Hebrides), *Eulejeunea camerunensis* (Cameroons), *E. gibbiloba* (Hawaii), *E. setulosa* (New Guinea), *E. subpililoba* (Mexico), *E. subsymphoseta* (Bolivia), *Euosmolejeunea brunnea* (India), *Harpalejeunea indica* (India), *H. Nietneri* (Ceylon), *Hygrolejeunea fasciculata* (New Guinea), *H. lanciloba* (Mexico), *H. pacifica* (Hawaii), *H. planiloba* (Colombia), *Leptocolea hispidissima* (Hawaii), *Leptolejeunea curvatifolia* (New Guinea), *L. integristipula* (New Guinea), *L. trialata* (Sumatra), *Lopholejeunea laceriloba* (Seychelles Islands), *L. oceanica* (Samoa), *L. Vescoana* (Tahiti), *Mastigophora guineensis* (New Guinea), *M. pyramidana* (New Guinea), *M. valida* (New Guinea), *Megaceros jamaicensis* (Jamaica), *M. tosanus* (Japan), *Microlejeunea inflatiloba* (India), *M. longirostra* (India), *Otigoniolejeunea crenulata* (New Guinea), *O. indica* (India), *O. Ledermanii* (New Guinea), *Prionolejeunea aberrans* (Madagascar), *P. erosodentata* (Surinam), *P. Galliotii* (French Guiana), *madagascariensis* (Madagascar), *P. pyriflora* (Madagascar), *Ptilidium Iishibae* (Japan), *Pycnolejeunea africana* (Cameroons), *P. palmicola* (New Guinea), *P. Wattsiana* (Australia), *Strepsilejeunea hamatifolia* (New Guinea), *S. heterophylla* (Java), *S. Novae Guinae* (New Guinea), *S. planifolia* (India), *Taxilejeunea Arsenii* (Mexico), *T. Beyrichiana* (Brazil), *T. cuneistipula* (Cameroons), *T. jamaicensis* (Jamaica), *T. mexicana* (Mexico), *T. obtusistipula* (Philippine Islands), *T. parvistipula* (India), *T. rotundiflora* (Cameroons), *T. tenerrima* (India), *Trichocolea Allionii* (Ecuador), *T. Ledermanii* (New Guinea), *T. Merrilliana* (Philippine Islands), *T. obconica* (Java and Philippine Islands), *T. pauciseta* (New Guinea), *T. rudimentaris* (New Caledonia), *T. samoana* (Samoa), and *T. tamina* (New Guinea). Of these species *Taxilejeunea jamaicensis* is a homonym, being superseded by *T. jamaicensis* Evans. There is likewise 1 new combination to be noted, *Strepsilejeunea khasiana* (Mitt.) Steph., based on *Lejeunea khasiana* Mitt. For the various genera here treated the species recognized by the author now total as follows: *Aneura*, 271; *Anthoceros*, 161; *Anoplolejeunea*, 2; *Aspiromitus*, 55; *Brachiolejeunea*, 69; *Ceratolejeunea*, 102; *Cheilolejeunea*, 69; *Cyclolejeunea*, 25; *Dendroceros*, 46; *Dicranolejeunea*, 34; *Drepanolejeunea*, 83; *Eulejeunea*, 196; *Euosmolejeunea*, 38; *Harpalejeunea*, 62; *Hygrolejeunea*, 106; *Lepidolaena*, 12; *Leptocolea*, 33; *Leptolejeunea*, 60; *Lopholejeunea*, 77; *Macrolejeunea*, 5; *Marchesinia*, 27; *Mastigophora*, 21; *Megaceros*, 46; *Microlejeunea*, 76; *Otigoniolejeunea*, 10; *Petalophyllum*, 3; *Prionolejeunea*, 65; *Ptilidium*, 6; *Ptychocoleus*, 87; *Pycnolejeunea*, 79; *Strepsilejeunea*, 53; *Taxilejeunea*, 123; and *Trichocolea*, 48.—*A. W. Evans.*

2767. Williams, R. S. **Note on Galapagos and Cocos Island mosses.** Bryologist **27:** 65. 1924.—The author enumerates 1 moss from Cocos Island and 2 from the Galapagos group, all collected by A. Stewart and accidentally omitted from an earlier list (see Bot. Absts. 14, Entry 512).—*E. B. Chamberlain.*

MORPHOLOGY AND TAXONOMY OF FUNGI, LICHENS, BACTERIA, AND MYXOMYCETES

H. M. Fitzpatrick, *Editor*
D. S. Welch, *Assistant Editor*

(See also in this issue Entries 2131, 2276, 2295, 2293, 2302, 2307, 2323, 2330, 2331, 2332, 2333, 2334, 2338, 2344, 2368, 2390, 2418, 2701, 2711, 2714, 2833, 2834, 2838, 2839, 2841, 2842, 2843, 2845, 2848, 2898, 2899, 2900, 2955, 2977, 3024, 3034)

FUNGI

2768. Anonymous. **Fusarium conference, University of Wisconsin, Madison, Wis.** Phytopathology 14: 435. 1924.—As a result of a conference during the past summer of several persons interested in taxonomy within the genus *Fusarium*, a paper on the identification of species is soon to be issued.—*B. B. Higgins.*

2769. Archer, W. Andrew. **The morphological development of Asterosporium Hoffmanni.** Mycologia 16: 220–232. *Pl. 15–16.* 1924.—The fungus was cultured, and its development followed. The primordium of the fruit body arises as a knarl of hyphae, which develops an outer layer and an inner conidium-bearing layer. Each "arm" of the conidium germinates apically as an individual spore. Openings were found connecting the component cells of each "arm." The conidia have certain points in common with those of *Helminthosporium.*—*G. R. Bisby.*

2770. Arthur, J. C. **Fern rusts and their aecia.** Mycologia 16: 245–251. 1924.—The author touches on the question of phylogeny and development of the rusts, and points out that ferns might be expected to bear primitive types of rusts.—The Osmundaceae, the most ancient ferns, bear a single rust, *Uredinopsis Osmundae*, with aecia on *Abies*, one of the oldest conifers. *Uredinopsis* shows several evidences of representing a primitive type of rust. The author considers that long cycled forms are more ancient.—The Polypodiaceae bear species of *Hyalopsora*, with aecia of the one connected species also on *Abies*. The genus shows an advance over *Uredinopsis*. *Milesia* and *Calidion* also occur on the Polypodiaceae, *Milesia*, at least, being somewhat less primitive than *Hyalopsora.*—The Schizaeaceae bear *Desmella*, perhaps a primitive *Puccinia*-like type of rust, and a species that is considered to belong to *Dicaeoma*. A brief discussion is given of the possible course of development of the rusts.—*G. R. Bisby.*

2771. Beckwith, Angie M. **The life history of the grape rootrot fungus Roesleria hyopgaea Thüm, et Pass.** Jour. Agric. Res. 27: 609–616. *1 pl.* 1924.—By growing the grape rootrot fungus, *Roesleria*, in pure culture from single ascospores it was shown that it has no conidial or other asexual spore stage. The fungus when grown on corn-meal agar, oatmeal paste, or on sterilized apple roots in large test tubes developed ascocarps in 5–12 months if the cultures were kept under refrigeration under such temperature and moisture conditions as prevailed in an ordinary ice box. Although this ascomycete has been described as *Pilacre subterranea*, *P. friesii*, etc., it is in no way connected with *Pilacre faginea* (*P. petersii*). Living grape roots were infected by spraying them with ascospores from cultures obtained from apple roots.—*L. O. Gaiser.*

2772. Buller, A. H. Reginald. **The organisation of the hymeniun of the common mushroom and its allies for the production and liberation of spores.** (Abstract) Rept. British Assoc. Adv. Sci. 1922: 397–398. 1923.

2773. Carleton, Mark Alfred. **Some remarks on the literature of rust fungi.** Science 60: 360–362. 1924.—In Harshberger's text-book it has been stated erroneously that *Puccinia graminis tritici* seldom occurs on barley. Other errors in nomenclature of spores and in certain species of *Puccinia* are corrected.—*C. J. Lyon.*

2774. Ciferri, R. **Seconda contribuzione allo studio degli Ustilaginales. (No. 23–47). [Second contribution to the study of Ustilaginales.]** Atti Ist. Bot. Univ. Pavia Ser. III, 1^2: 77–97. 1924.—The author continues his studies on the Ustilaginales, his first contribution having appeared in Bull. Soc. Bot. Ital. Feb. 1924, P. 46–59. He lists with synonymy, Latin

descriptions, habitat and numerous notes the following species: *Tuburcinia eranthidis* (Passerini) Liro (nomen nudum), *T. magica* (Pass.) Liro, *T. scillae* Ciferri n. sp., *T. Ferrarisiana* Ciferri n. sp., *T. ranunculi-lanuginosi* (De Candolle) Liro (nomen nudum), *Entyloma crastophilum* Sacc. emend. *Ciferri*, *E. Crepinianum* Sacc. et Roum. emend. Ciferri, *E. thalictri* Schr., *E. corydalis* DeBary, *E. pustulosum* Sacc. et Fautrey. *E. hydrophilum* Sacc. et Paoletti, *E. veronicum Lagerheim*, *E. madiae* Ciferri n. sp., *E. matricariae* Rostrup, *E. achilleae* P. Magnus, *E. Lagerheimi* Ciferri n. sp., *E. dahliae* Sydow, *E. Leontodontis* Syd., *E. arnoseridis* Syd., *E. flavum* Ciferri n. sp., *E. dubium* Ciferri n. sp. ad interim, *E. sparganii* (Lagersheim) Ciferri n. comb., *E. muscari* (Pass.) Schr., *Melanotaenium majus* (Har. et Pat.) Ciferri n. comb., *Cylindrosporium ranunculi* (Bonorden) Sacc.—*P. D. Caldis.*

2775. Davis, W. H. **Summary of investigations on clover rusts.** Mycologia **16**: 203–219. *Pl. 14.* 1924.—The author summarizes the literature, and reports inoculation and spore germination tests and a morphological study, from which he concludes that the clover rusts should be taxonomically designated as follows: *Uromyces Trifolii-repentis* (Cast.) Liro on *Trifolium repens*, *U. Trifolii* (Hedw. f.) Lév. on *T. pratense* and *T. medium* and *U. Hybridi* sp. nov. on *T. hybridum*. Each rust is an autoecious long-cycle form. Each species is biologically and morphologically distinct. *U. hybridi* is described.—*G. R. Bisby.*

2776. Grove, W. B. **The British species of Cytospora.** Kew Bull. **1923**: 1–30. 1923.—The article begins with a 4-page discussion of the general characteristics of the group. Then follows an alphabetical list of 62 species fully described with habitat, and including the known distribution, mainly European, other than British. Critical notes on difficult or obscure species are given. *Cytospora Lonicerae* found on branches of *Lonicera*, and *C. Symphoricarpi* found on stems of *Symphoricarpus racemosus* are described as new. Seven previously included species are excluded. An index of hosts is given.—*T. J. Fitzpatrick.*

2777. Guba, E. F., and P. A. Young. **Check list of important references dealing with the taxonomy of fungi.** Trans. Amer. Microsc. Soc. **43**: 17–67. 1924.—This paper consists of a list of about 1060 citations dealing with monographic and other especially important mycological books and papers. With the exception of the list of general works on the classification of fungi, the citations are arranged under the names of the classes, orders, or families of fungi with which they are particularly concerned. Most of the citations deal with literature published between 1900 and 1923 inclusive.—*P. A. Young.*

2778. Lindfors, Thore. **Studien über den Entwicklungsverlauf bei einigen Rostpilzen aus zytologischen und anatomischen Gesichtspunkten.** [Cytological and anatomical studies on some Uredineae.] Svensk Bot. Tidskr. **18**: 1–84. *5 pl., 20 fig.* 1924.—The 1st part of the work deals with alternation of the nuclear phases and spore formation. In addition, a great many anatomical details are given. In *Melampsora reticulatae* Blytt, the vegetative mycelium consists of uninucleate cells. Spermatiophores are multicellular and ramified. Cell-fusions of the type described by Christman take place in the aecidial sori. The same was found to be the case with *Coleosporium Euphrasiae* (Schum.) Wint. In the Alpine form of *Uromyces Acetosae* Schröt. On *Rumex arifolium* the vegetative mycelium consists of uninucleate cells and bears aecidiospores and teleutospores simultaneously. The formation of each kind of spore is preceded by cell-fusion. *Puccinia Tragopogi* (Pers.) Cda. has a perennial mycelium the cells of which are uninucleate in full-grown leaves of the host, as well as in young aecidia where later cell-fusions of the Christman type take place. In embryonal parts of the host plant the cells of the mycelium are multinucleate. Young aecidia, found in these parts, also contain multinucleate cells. In *Triphragmium Ulmariae* (Schum.) Link., cell-fusions of both the Christman and the Blackman type occur. In *Trachyspora Alchemillae* (Pers.) Fuckel, multinucleate mycelial cells are found in the embryonal parts of the host plant and uninucleate cells in the older parts. Cell-fusions of both the above mentioned types were found before formation of uredospores, 1–3 uredospores being formed from the same basal cell. In *Puccinia glumarum* (Schmidt) Eriks. et Henn. the mycelium resulting from uredospore infection has few cell walls and many nuclei in each cell. Walls are generally formed later, 2 nuclei resulting in each cell. No mycoplasma-formation such as described by Eriksson was found. Incomplete notes are given on the development of the following: *Uromyces ambiguus* (DC.) Lév., *Pucciniastrum Pirolae* (Karst.) Schröt., *Thecopsora sparsa*

(Wint.) Magn., *Hyalopsora Polypodii-Dryopteridis* (Moug. et Nestl.) Magn. and *Chrysomyxa Empetri* (Pers.) Schröt. All have binucleate mycelial cells. In *Hyalopsora Polypodii-Dryopteridis*, uredo-sori were found with peridium and stalked uredospores. Anatomical notes are given on the development of the teleuto-sori of *Puccinia Malvacearum* Mont., *Tranzschelia fusca* (Pers.) Diet. and *P. Morthieri* Koern. In *Puccinia Arenariae* (Schum.)Wint. the mycelium and teleuto-sori consist of binucleate cells. At the germination of the teleutospore, which takes place in the sorus, a promycelium is formed with but 2 cells, each with 1 nucleus that later divides into 2. Each cell produces 1 sporidium. The binucleate condition of the mycelium thus arises through failure of the species to form septa following the 2nd division in the promycelium. Such a case has never before been found in any rust. Other micro- or lepto- forms in which the cells of the mycelium are binucleate are *Puccinia allrulensis* Magn., *P. Epilobii* DC., *P. gigantea* Karst., *P. Holboellii* (Hornem.) Rostr., *P. Saxifragae* Schlecht and *Uromyces Solidaginis*. In *Chrysomyxa Abietis* (Wallr.) Ung. they are uninucleate. Cell-fusions take place in the young teleuto- sori and nuclear fusions in the young teleutospores.—The 2nd part of the paper deals with nuclear divisions. In the promycelium of *Puccinia Arenariae*, spindles are formed with small centrosomes. The divisions apparently represent meiosis. The haploid chromosome number is 4. In the conjugate nuclear divisions in the hyphae of *Melampsora reticulatae* and *Tranzschelia fusca*, apparently extranuclear spindles with centrosomes are developed. The conclusion is reached that the transition from the uninucleate to the binucleate phase is a substitute for a real fertilization. The genus *Trachspora* is referred to the Phragmidieae. The genera *Ochropsora* and *Tranzschelia* are regarded as related with one another but not with *Coleosporium* as generally supposed.—*O. Heilborn.*

2779. Murrill, W. A. **Truffles and truffle hunters.** Sci. Amer. **130:** 332, 368. *8 fig.* 1924.—Notes are given concerning European and American truffles and the manner of gathering them.—*Chas. H. Otis.*

2780. Overholts, L. O. **Mycological notes for 1921–22.** Mycologia **16:** 233–239. *Pl. 17.* 1924.—Notes are given on *Septobasidium pinicola* Snell on the bark of *Pinus Strobus; Boletus parasiticus* (Bull.) Fr. on *Scleroderma; Hypoderma lineare* Peck on *Pinus Strobus; Hymenochaete agglutinans* Ellis on *Rhododendron, Alnus, Viburnum dentatum*, and *Tsuga canadensis; Phomopsis juniperovora* Hahn on *Thuja occidentalis* and *T. orientalis; Wynnea americana* Thaxter; *Scoleconectria scolecospora* (Bref.) Seaver on *Pinus* and *Abies balsamea; Volutella Buxi* (Corda) Berk. on *Buxus;* and *Phyllosticta confertissima* Ell. and Ev. on *Ulmus americana* and *U. fulva.—G. R. Bisby.*

2781. Plunkett, O. A., P. A. Young, and Ruth W. Ryan. **A systematic presentation of new genera of fungi.** Trans. Amer. Microsc. Soc. **42:** 43–67. 1923.—This paper lists and cites most of the new genera described between 1910 and 1922 inclusive. Approximately 850 new generic names are arranged alphabetically under the names of the families in which they belong. About 175 new genera should be added to make the list complete through 1924. Forty-eight genera were not put into families by the authors describing them. In compiling this list, it was found that approximately 8000 new species of fungi have been described since 1910.—*P. A. Young.*

2782. Setchell, W. A. **Three new fungi.** Mycologia **16:** 240–244. *Pl. 18–19.* 1924.—**Daleomyces** based on *D. Gardneri*, is described as a new genus of the Balsamiaceae. *Acrospermum candidum*, on leaves of *Alsophila quadripinnata* and *Thecaphora Ruppiae* on *Ruppia maritima* var. *rostrata* are also described as new.—*G. R. Bisby.*

2783. Walker, L. B. **Development of Cyathus fascicularis, C. Striatus, and Crucibulum vulgare.** Bot. Gaz. **70:** 1–24. *Pl. 1–4, 3 fig.* 1920.—All 3 species were grown in culture, but mature fruit-bodies were obtained only for *C. fascicularis*. Clamp connections were abundant on all mycelia examined. Cells of *C. fascicularis* and the spores of all 3, were binucleate. The basidiocarps in all 3 forms usually arise from mycelial strands, the primordium arising slightly below the tip of the strand; the latter is composed of smaller, closely interwoven hyphae. The 1st differentiation consists in the gelatinization of a zone that becomes part of the peridium. The peridiola originate around points toward which the ends of hyphae converge. Chambers arise between these converging hyphae, enlarge, and become lined with

basidia. The basidia do not form a definite uniform layer. The funiculus arises from strands of hyphae extending from peridium to peridiola. The mature funiculus is quite different in appearance in the 2 genera. At maturity, in *Cyathus*, the peridium opens at the top, exposing the undifferentiated ground tissue surrounding the peridiola. Around the latter, the ground tissue gelatinizes, that at the top being the last to undergo gelatinization and remaining as an epiphragm. In *Crucibulum*, the epiphragm is made up of the undifferentiated upper part of the basidiocarp as seen in undifferentiated fruit-bodies. It undergoes gelatinization following that of the ground tissue surrounding the peridiola. The most marked difference between the 2 genera is in the structure of the mature peridial walls. The peridium of *Cyathus* contains a central pseudoparenchymatic layer which is entirely wanting in *Crucibulum*.—*L. B. Walker.*

2784. Wilson, Malcolm. **The cytology and life-history of Tuburcinia.** (Abstract) Rept. British Assoc. Adv. Sci. **1922:** 398. 1923.

LICHENS

2785. Bouly de Lesdain, M. **Notes lichenologiques, XX.** [Notes on lichens.] Bull. Soc. Bot. France **70:** 277–283. 1923.—The author describes the following new species, forms, and varieties of lichens: *Ramallia calicaris pyrenaica* n. var. *Usnea levis sorediosa* n. f., *Parmelia Sbarbaronis* n. sp., *Peltigera canina caesio-violacea* n. f., *Aspicilia calcaria caesio-alba* (Le Pr.), *A. mediterranea* n. sp., *Acarospora Crozalsii* n. sp., *Lecidea italica* n. sp., *Psora testacea agrillicola* n. var., *P. opaca crocea* n. var., *Buellia cinereomarginata* n. sp., *Lecanatis patellarioides convexa* n. var., *L. Saltelii ecrustacea* n. f., *Opegrapha betulinoides* n. sp., *O. subsiderella rubella* n. f., *Verrucaria Sampaiana* n. sp., *V. viridiolivacea* n. sp., *Thelidium prasimum* n. sp. The following changes are made: *Calicium melanophaeum subsessile* Lamy becomes *Chaenotheca melanophaea subsessilis* (Lamy) A. Zahlb., *Aspicilia calcaria caesio-alba* (Le Pr.) B. de Lesd. replaces *Urceolaria caesio-alba* Le Provost, *Lecanora cinerea caesio-alba* Nyl. and *Aspicilia caesio-alba* Hue. *Buellia lactea* replaces *B. indissimilis* (Nyl.) and *B. lactea*, also *Lecidea indissimilis*. *Verrucaria Sampaiana* replaces *V. Romeanam*, bothn ames by B. de Lesd.—*P. A. Young.*

2786. Bouly de Lesdain, M. **Notes lichenologiques, XXI.** [Notes on lichens.] Bull. Soc. Bot. France **70:** 842–849. 1923.—The author describes the following: *Sphinctrina microcephala clavata* n. var., *Parmelia dueia caesio-cinerea* n. var., *Physcia tribacia caesiella* n. f., *Squamaria crassa crenualta* n. var., *Lecanora intricata lecideoides* n. var., *Aspicilia Meylani* n. sp., *Toninia meridionalis* n. sp., (*Buellia Duarti* Samp. n. sp.), *Endopyrenium hepaticum concavum* n. var., *Acrocordia alba carnea* n. f. *Porina carpinea fusca* n. f., and *Polyblastiopsis myrticola* n. sp.—*P. A. Young.*

2787. Du Rietz, G. Einar. **Lichenologiska fragment VI. De skandinaviska Alectoria-arterna.** [Lichenological fragments VI. The Scandinavian species of Alectoria.] Svensk Bot. Tidskr. **18:** 141–155. 1924.—Keys in Swedish and Latin are given to the species listed, namely, to *Alectoria thrausta* Ach., *A. ochroleuca* (Ehrh.) Nyl., *A. sarmentosa* Ach. and its var. *sorediosa* (Lång.) Du Rietz (f. *sorediosa* Lång.) and var. *cincinnata* (Fr.) Nyl., *A. nigricans* (Ach.) Nyl., *A. divergens* (Ach.) Nyl., *A. bicolor* (Ehrh.) Nyl., *A. nidulifera* Norrl., *A. simplicior* (Wain.) Lynge, *A. Fremontii* Tuck. and its subspec. *olivacea* Räs., and to *A. jubata* (L.) Ach. The author has returned to the old collective conception of the last mentioned species, as it seems impossible to draw any sharp limits between the varieties. For practical purposes, however, the following varieties are recognized: var. *prolixa* (*A. jubata & A. prolixa* Ach.), var. *lanestris* (*A. jubata & A. lanestris* Ach.), var. *nitidula* Th. Fr., var. *cana* Ach.) and var. *implexa* (*A. jubata & A. implexa* Ach.)—*O. Heilborn.*

2788. Maheu, Jacques, et Abel Gillet. **Contribution a l'étude des lichens des îles Baléares.** [Contribution to the study of the lichens of the Blaeares Islands.] Bull. Soc. Bot. France **69:** 41–50, 96–104, 196–205. 1922.—This article contains the following descriptions: *Lecanora glaucescens* Hue n. sp., *L. rufofusca* Mah. et Gill. n. sp., *L. stenospora* Hue n. sp., and *Lecania balearica* Mah. et Gill.n. sp. Tables of generic and specific names are given.—*P. A. Young.*

2789. Maheu, Jacques, et Abel Gillet. **Station anormale européenne d'un lichen rare: Neuropogon melaxanthus Nyl.** [An abnormal European habitat of a rare lichen, N.

melaxanthus.] Bull. Soc. Bot. France 70: 487–491. *Fig. 1–4.* 1923.—The specimens were collected in England. A description is given.—*P. A. Young.*

2790. Mameli, Eva. **Contributo alla lichenologia del Forlivese.** [**Contribution to the lichenology of Forlivese.**] Atti Ist. Bot. Univ. Pavia Ser. III, 1^2: 13–34. 1924.—The author has studied and listed some 200 species and varieties of lichens collected by P. Zangheri in the Province of Emilia, Italy. Some 128 are new for Emilia and about 30 rare for Italy.—*P. D. Caldis.*

2791. Mereschkovsky, C. **Schedulae ad Lichenes Ticinenses Exsiccatos.** [**Labels for the distributed series of lichens of Tessin (Switzerland).**] Ann. Conservatoire et Jard. Bot. Genève 21: 145–216. 1919.—The work covers the 1st 4 fascicles (numbers 1–100). Several new forms and varieties and the following new species are described: *Physcia cycloselis* (Ach.) Mer. (*Parmelia cycloselis* Ach.); *P. hirsuta* Mer., *P. labrata* Mer., *P. pusilla* Mer., *P. luganensis.* Mer., and *P. insignis* Mer.?—*A. S. Hitchcock.*

BACTERIA

2792. Genung, Elizabeth F. **Endo agar as affected by peptone.** Science 59: 282–283. 1924.—A common laboratory difficulty in the use of this medium is the diffusion of a deep pink color over the plate. When Witte's peptone was used in place of an American peptone such diffusion was completely avoided. Further experiments confirmed this observation and new studies are in progress to determine the action of various kinds of peptone and fuchsin.—*C. J. Lyon.*

2793. Jones, Henry N. **Note on cellobios as a differentiating sugar for certain bacteria.** Science 60: 455. 1924.—This rare sugar may be of definite assistance in differentiating members of the genera, *Escherichia* and *Aerobacter.*—*C. J. Lyon.*

2794. Mulvania, Maurice. **A culture tube for use with collodion sacs.** Science 60: 336. 1924.—An illustration shows an arrangement for the culture of microorganisms on opposite sides of a collodion sac.—*C. J. Lyon.*

2795. Sideris, C. P. **An apparatus for the study of microorganisms in culture solutions under constant hydrogen ion concentrations.** Science 60: 17–19. 1924.

2796. Velu, H. **La blastomycose des voies lachrymales de l'âne et son inoculabilité.** [**Blastomycosis of the lachrymal canals of the ass, and its inoculability.**] Bull. Soc. Path. Exotique 17: 545–547. 1924.—*Cryptococcus mirandei* is described as a new species, specific for the ass; it has not yet been cultured. The contents of a tumor crushed in physiological solution and introduced into the eye under the conjunctiva produced the disease in 3 animals inoculated.—*Philip Brierley.*

MYXOMYCETES

2797. Jahn, E. **Beiträge zur botanischer Protistologie. I. Die Polyangiden.** [**Botanical protistology. I. The Polyangidae.**] *107 p. 2 col. pl.* Gebrüder Borntraeger: Leipzig, 1924.—The author states that he hopes to follow the present monograph with a comprehensive work on the life history and development of the Myxomycetes, which will be treated more at length and in more detail than the Polyangidae. This 1st contribution is called a monograph because the author has aimed at completeness from the systematic viewpoint and has placed in the foreground the derivation and relationships of the Polyangidae, questions hitherto but little known and in dispute. Concerning the general natural history of the group he has endeavored to contribute something toward the solution at least of the more important questions which strike the investigator. The physiological relationships of these remarkable organisms still bristle with problems regarding which further research is desirable and promising of far reaching results. After an introductory review of the literature the subject matter, is discussed under the following headings. (1) The "Schwarm:" previous observations, "Schwarm" or plasmodium?, the "Schwarm" a pseudoplasmodium?, reasons for erroneous assumptions.—(2) The rods: problematic statements concerning structure and motility; the living rod; locomotion by utilization of streaming energy; motility and slime formation by the rods; membrane, cell contents and nucleus; cell division of the rods.—(3) Development of the fructification: "anlage" of the fruiting body, formation of the cystophore and of the membrane,

developmental physiology of the fructification, resting stage and germination of cysts and spores.—(4) Theoretical relationships, taxonomy and geographic distribution.—(5) General observations: biology and nutrition of the "Schwarm," analogies of fruiting body development, relationships of the group.—The main body of the work is followed by a bibliography of 2 pages.—*Frederick V. Rand.*

2798. Pascher, A. [**Rev. of: Pascher, A. Über die Myxomyceten. (The myxomycetes.)** Ber. Deutsch. Bot. Ges. 36: 44. *7 fig.* 1918.] Arch. Protistenk. 40: 103–108. *7 fig.* 1919.—The question arises again concerning the genetic position of the myxomycetes. These are characterized by sporulation, uniflagellate swarmspores which become amoebae and form zygotes, and the construction of a large diploid plasmodium. The characteristic peculiarities of the myxomycetes are all to be found among the flagellates, save that in the former the cyst stages are formed from reduced, haploid cells, while in the latter the encysted stages are generally diploid. The flagellate derivation of the myxomycetes is indicated by these resemblances; the exception is an adaptation to the mode of life.—*Harold Kirby.*

PALEOBOTANY AND EVOLUTIONARY HISTORY

E. W. Berry, *Editor*

(See also in this issue Entries 2255, 2289, 2581, 2605)

2799. Anonymous. **New ideas of prehistoric flora.** Sci. Amer. 130: 403. *3 fig.* 1924.—A short account is given of the discovery of "coal balls" and their bearing on the knowledge of early plant life.—*Chas. H. Otis.*

2800. Astre, Gaston. **La Faune Stampienne de Portel. [The Stampian fauna of Portel.]** Bull. Soc. Geol. France 24: 132–145. *Fig. 6.* 1924.—This is primarily a faunal study, but on page 143 the author describes *Chara costulata* n. sp., from the lower Stampian of Portel, Dept. Aude, France.—*E. W. Berry.*

2801. Buwalda, John P. **The age of the Payette formation and the old erosion surface in Idaho.** Science 60: 572–573. 1924.—This paper is of paleobotanical interest because of its bearing upon the age of the flora found in the Payette formation which was considered Miocene by Knowlton in 1898, Eocene by Knowlton in 1900, and Miocene by Chaney in 1918. On the evidence of the mammalian fauna collected by the author, which contains proboscidian and other characteristic remains, it is concluded that the age of the Payette is middle Neocene, and very probably late Miocene.—*E. W. Berry.*

2802. Carpentier, Alfred. **Découverte de fragments de Fougères fossiles de genre Tempskya Corda (emend. Kidston et Vaughan) à Glageon (Nord). [Discovery of fragments of the fossil fern of the genus Tempskya Corda (emend. Kid. and Vaug.) in Glageon.]** Bull. Soc. Bot. France 70: 68–72. *Fig. 1.* 1923.—Specimens of this plant are recorded from Glageon in northern France. These are said to resemble the Maryland form *T. Whitei* Berry. The genus belongs in the Pteridophyta, and a description is given.—*P. A. Young.*

2803. Carpentier, Alfred. **Quelques empreintes végétales du Carbonifère de la Sarthe et de la Mayenne. [Carboniferous plants from the Sarthe and Mayenne.]** Bull. Soc. Géol. France 24: 125–131. *Pl. 3, 4.* 1924.—The author describes 4 different forms of *Lepidodendron*, species of *Cardiopteris* and *Sphenopteris* from the areas cited in the title, and concludes that the horizon indicated is near the base of the upper Culm.—*E. W. Berry.*

2804. Chow, T. C. **Preliminary note on some younger Mesozoic plants from Shantung.** Bull. Geol. Surv. China 5[2]: 136–141. *Pl. 1, 2.* 1923.—The following forms from an undetermined horizon in the Lower Cretaceous of the province of Shantung, China are recorded: *Brachyphyllum obesum* Heer, *B. magnum*, n. sp. and *B. multiramosum*, n. sp.; *Sphenolepis elegans*, n. sp., and *S. arborescens*, n. sp.; *Pagiophyllum* sp., *Palaeocyparis* cf. *flexuosa* Saporta, *Araucarites* sp., *Baiera* cf. *australis* M'Coy, *Zamites* sp., and *Thinnfeldia* sp.—*E. W. Berry.*

2805. Fritel, P. H. **Suite et additions a la révision de la flore Cuisienne des grès de Belleu. [Continuation and additions to the revision of the Cuisian flora of the sandstone of Belleu.]** Bull. Soc. Géol. France 24: 50–175. *20 fig.* 1924.—This paper is a continuation of the revision of the Eocene plants of the Belleu sandstone which the author commenced 10 years

ago. It is almost entirely a revision of the classic but unsatisfactory work of Watelet on the fossil plants of the Paris basin published in 1866. The present author recognizes but 55 instead of the 138 species named by Watelet. Forms regarded as *Ficus* are transferred to *Sapotacites, Dombeyopsis* is referred to *Grewia*, species of *Quercus* are transferred to *Anacardites* and *Cupanites, Chrysophyllum* becomes *Anacardites, Banisteria* and *Artocarpidium* become *Ficus*, various leguminous pods named by Watelet *Acacia, Entada, Caesalpinia, Gleditsia* and *Trigonella* are referred to *Leguminosites*, and *Leguminosites gymnocladoides* is described as new. Specimens of a considerable number of forms described by Watelet as species of *Salix, Alnus, Quercus, Ficus, Laurus, Cinnamomum, Apocynophyllum, Magnolia, Juglans, Hicoria, Terminalia, Pyrus, Piscidia, Cercis* and *Caesalpinia* are regarded as absolutely undeterminable.—*E. W. Berry.*

2806. Håkansson, Arthur. **Beiträge zur Entwicklungsgeschichte der Taccaceen. [Contribution to the evolution history of the Taccaceae.]** Bot. Notiser **1921**: 189–220, 257–268. 1921.

2807. Hutchinson, J. **Affinity of Rhododendron micranthum.** Kew Bull. **1922**: 299–301. *1 fig.* 1923.—This gives the known area of distribution of *Rhododendron micranthum* Turcz. in northern China and of *Ledum glandulosum* Nutt. in western North America. The author considers the genus *Ledum* as more primitive than *Rhododendron* and that the origin of *Rhododendron micranthum* may have been from an ancestral type similar to *Ledum glandulosum.*—*T. J. Fitzpatrick.*

2808. Jeffrey, Edward C. **The present status of the biogenetic law.** Science **60**: 531–536. 1924.—The author reaffirms his faith in the doctrine of recapitulation using in large part his studies and theories of the relationships of the gymnosperms as illustrations. Examples of the doctrine are furnished by anatomical features of seedlings, roots, coneaxes, and stems; and to traumatically induced reversions. The outcome, as might be expected, is the relationship which the author has long advocated, namely, that *Pinus* and *Ginkgo* are the most ancient and primitive of existing conifers, that araucarian conifers are derived from the former, and that the Mesozoic, instead of being an age characterized by Araucaria-like forms contains but 2 types which the author and his students would admit to such a relationship, the opinions of all other students of these Mesozoic forms being "gross fallacies" and showing "a deplorable neglect of comparative anatomy on the part of European paleobotanists."—The author concludes that "When the doctrine of mutation is relegated to its relatively unimportant position among biological working hypotheses, the great general significance of the biogenetic law will be clearly recognized."—*E. W. Berry.*

2809. Jongmans, W. J., and F. H. van Rummelen. **Isoetes voorkomen in Limburg verwantschap met fossiele vormer. [The occurrence of Isoetes in Limburg and its comparison with fossil forms.]** Naturhist. Maandblad **13**: 111–114. *pl. 1–2.* 1924.—An account is given of the occurrences of *Isoetes* in Limburg and a discussion of its relationship to fossil forms referred to this genus and to *Stigmariopsis, Nathorstiana* and *Pleuromeia.*—*E. W. Berry.*

2810. Knowlton, F. H. **Flora of the Animas formation.** U. S. Geol. Survey Prof. Paper **134**: 71–114. *Pl. 5–19.* 1924.—This contribution forms the 2nd part of Professional Paper 134 of which the 1st part, by John B. Reeside, Jr., is devoted to a description of the Upper Cretaceous and Tertiary formations of the western part of the San Juan basin in Colorado and New Mexico. The Animas formation is considered by Knowlton to be early Eocene and of approximately the same age as the Raton, Denver and Wilcox formations. Fifty-nine species of plants are enumerated of which the following 19 are described as new: *Anemia grandifolia, Salix reesidei, Juglans (?) innominata, Fagus crossii, Dryophyllum berryana, Ficus pagosensis, Oreodaphne pagosensis, Cinnamomum salicoides, Crataegus (?) gigantea, Rhus coloradensis, Zizyphus lanceolatus, Z. daphnogenoides, Aralia lobata, A. reesidei, Carpites sulcatus, Phyllites eocenica, P. herbacea, P. pagosensis*, and *P. innominata.*—*E. W. Berry.*

2811. Kräusel, R. **Über pflanzenführende Kreideschichten aus der Umgebung von Heerlen (Holland. Limburg) und die Verbreitung des Aachener Sandes in den südlichen Niederlanden. [Plant bearing Cretaceous near Heerlen in Dutch Limburg and the Distribution of the Aachen sand in southern Netherlands.]** Senckenbergiana **5**: 145–154. *Pl. 5.* 1923.—Remains are recorded of fungi, *Araucaria, Elatocladus, Sequoia*, and *Betula (?)* from the

Upper Cretaceous Aachen sands, or sands of Aix-la-Chapelle, near Heerlen; and the extent of these sands in southern Holland is discussed.—*E. W. Berry.*

2812. Kräusel, R., and H. Weyland. **Beiträge zur Kenntnis der Devonflora. [Contribution to an understanding of the Devonian flora.]** Senckenbergiana 5: 154–184. *Pl. 6–9.* 1923.—The authors discuss at length new material of *Hostimella hostimensis*, and the systematic position of the Psilophytales. A new genus, **Aneurophyton,** of which the type is *A. germanicum*, is proposed for certain fern-like fossils; and the associated remains found in the Honseler beds of Hardtberge near Elberfeld, of middle Devonian age, are described. The last include *Nematophyton Dechenianum* Solms, *Psilophyton princeps* Dawson, and various sporangial forms.—*E. W. Berry.*

2813. Lipman, Charles B. **The origin of life.** Sci. Monthly 19: 357–367. 1924.—The author presents a few theories that others have developed, beginning with Aristotle's spontaneous generation and adding one of his own which assumes a substance similar to an amino-acid or a polypeptid with attributes of life.—*L. Pace.*

2814. Maffei, Luigi. **Contributo allo studio della flora fossile del deposito lacustre di Pianico. [Contribution to the study of the fossil flora of the Pianico lake deposit.]** Atti Ist. Bot. Univ. Pavia Ser. III. 1^2: 47–69. *Pl. 3–5.* 1924.—The following species of plants were identified from fossil material collected in the quaternary lake deposits of the marl of Pianico, Italy; 18 are reported from Pianico for the 1st time. (1) Fungi: *Rhytisma acerinum* (Pers.) Fr., *Phyllosticta propinqua* Ferr. et Sacc., *Phoma* sp., *Macrophoma Candollei* (B. et Br.), Berl. et Vogl., *Vermicularia* sp. (2) Mosses: *Neckera crispa* (L.) Hedw. (3) Gymnosperms: *Pinus Peuce* Griseb., *P.* sp., *Abies pectinata* D. C., *Taxus baccata* L. (4) Angiosperms: *Phragmites communis* Tr., *Salix* sp., *Populus alba* L., *Alnus glutinosa* (L.) Gaertn., *Carpinus Betulus* L., *Corylus Avellana* L., *Quercus Robur* L., *δ sessiliflora* (Salisb.), *Castanea sativa* Mill., *Ulmus campestris* L., *Prunus spinosa* L., *P.* sp., *Crataegus oxycantha* L., *Cytisus alpinus* Mill., *Acer Opalus* Mill., *A. neapolitanum* Ten., *A. Opalus* Mill. var. *elongatum* Chabert., *A. Laetum* C. A. Meyer, *A. Peronaï* Schwerin, *Boxus sempervirens*, L., *Rhododendron ponticum* L., *Viburnum Lantana* L., *Tilia platyphylla* Scop. An extensive bibliography and a table listing the plants found in quaternary deposits in Lombardy, are appended.—*P. D. Caldis.*

2815. Principi, Palo. **Flora Rupeliana del Bacino di Bagnasco (Piemonte). [Flora Rupeliana from the Bagnasco basin (Piedmont).]** Atti Soc. Lig. Sci. e Lett. 3:1–55. *Fig. 5. pl. 1.* 1924.—The author records a large number of well known Tertiary species from the middle Oligocene of Bagnasco in the Italian Piedmont representing a supposed alga and a fungus, an *Equisetum*, 2 species of the fern genus *Goniopteris*, 5 gymnosperms of the genera *Glyptostrobus, Sequoia, Taxodium* and *Ephedra;* 4 monocotyledons in the genera *Phragmites, Cyperus, Cyperacites* and *Phoenicites;* and species in the following dicotyledonous genera: *Castanea, Quercus, Juglans, Hicoria, Myrica, Alnus, Salix, Ficus, Laurus, Cinnamomum, Grewia, Sapindus, Ilex, Paliurus, Berchemia, Rhamnus, Platanus, Terminalia, Eucalyptus, Inga, Mimosites, Machaerium, Cassia, Leucothoe, Echitonium, Apocynophyllum,* and *Neritinium.*—*E. W. Berry.*

2816. Reis, Otto M. **Kalkalgen und Seesinterkalke aus dem rheinpfälzischen Tertiär. [Calcareous algae and marine calcareous sinter in the Tertiary of the Rheinpfalz.]** Geogn. Jahresh. 36: 103–130. *Pl. 3–5.* 1923.—The author figures and describes in great detail the following forms: *Ternithrix compressa* (Rivulariaceae); *Cladophorites incrustata, C. helix* and *C. dubius* (Cladophoraceae); *Chlorellopsis colomata C. minima* and *C.* sp., (Protoccaceae); *Microchorton claviger* (Protosiphonacae); *Dendractis brevis, D. compacta* and *D. Brachydactylus radialis* (Archaetophoraceae); *Dimorphostroma palatinum* and *D. diffusum* (Codiaceae?).—*E. W. Berry.*

2817. Reis, Otto M. **Oolithartige Versteinerung von Pflanzenresten aus dem Tertiär der Rheinpfälz. [Oolitic-like concretions with fossil plants in the Tertiary of the Rheinpfalz.]** Geogn. Jahresh. 36: 1–16. *Pl. 1.* 1923.—The author describes the physical and chemical composition, and the traces of plants in the oolitic-like calcareous masses found in the Miocene of the upper Rhein valley in Germany.—*E. W. Berry.*

2818. Reis, Otto M. **Versteinungen von Flötzteilen im Steinkohlengebirge. [Petrifactions from coal partings in the Carboniferous.]** Geogn. Jahresh. 36: 27–48. *Pl. 2.* 1923.—

Mainly devoted to a physical and chemical genetical study of the coarse and fine grained and dolomatized nodules or concretions in the Carboniferous. Both the oolitic-like and coarsely crystalline calcareous nodules from St. Ingbert contain plants, the former a polleriana *Sigillaria*. Dolomitic masses or "coal balls" from the Ruhr are packed with vegetable debris showing structure. Figures are given but no botanical description is attempted.—*E. W. Berry.*

2819. Rudolph, Karl, and Franz Firbas. **Paläofloristische und stratigraphische Unterschungen böhmischer Moore. Die Hochmoore des Erzgebirges. [Paleofloristic and stratigraphic investigations of the Bohemian peat bogs or moors.]** Beih. Bot. Centralbl. Abt. 2. **41**: 1–162. *Pl. 1–16, fig. 1–6.* 1924.—This is a study of the high moors of the Erzgebirge, relative to the postglacial history of Bohemian forests. Eleven moors of 5 groups at elevations of 820 to 1010 m. were investigated, using the pollen analysis, paleofloristic, and strategraphic methods.—Seventy-two fossil species were found in the peat.—By the pollen method the following periods of forest development were established: (1) Pine period with birch and willow; (2) pine-hazel period and the beginning of the mixed oak forest (elm, linden, oak); (3) mixed oak-pine period with coming in of beech and hornbeam (*Carpinus*); (4) beech-pine period with coming in of fir (*Abies*); (5) beech-fir period; and (6) recent pine period.—The ice-age reduced the flora of the lower areas; beech, fir, and hornbeam disappeared entirely. Hazel, pine, elm, linden, oak and alder reappeared in early post-glacial time. The great development of hazel, linden, elm, oak, alder, and phragmites 400 m. above their present upper limit, suggest a post glacial warm period, warmer than the present. Dry periods probably occurred, but are not easy to demonstrate as only small moors would vary enough to show these changes. A bibliography of 91 references is given.—*L. Pace.*

2820. Sandegren, R. **Ragundatraktens postglaciala untvecklingshistoria enligt den subfossila florans Vittnesbörd. [Post glacial developmental history of the Ragunda valley and the subfossil flora of Vittnesbörd.]** Sverg. Geol. Undersök. 12^3: 1–55. 1924.—This paper is the 3rd constituting this volume of memoirs of the Swedish Geological Survey, all of which are devoted to an exhaustive account of Ragunda basin in Jamtland, Sweden. Many plants are found in the postglacial sediments of the region, the author enumerating 58 vascular plants, 40 mosses, 131 diatoms and a few animal remains. The chronology is established by means of the banded clays, and by means of pollen analyses and other criteria the climatic and floristic succession is worked out in great detail. This history commences with a boreal climate about 7000 B.C., the characteristic plants being *Pinus silvestris, Betula odorata, Alnus incana,* and *Populus tremula,* these being preserved in the sediments of a fjiord opening into the Ancylus sea. After about 1300 years the climate became warmer and moister (Atlantic or Litorina time) with such south Scandinavian forms as *Carex pseudocyperus, Corylus avellana, Lycopus europaeus, Solanum dulcamera, Stachys silvatica,* etc. After 2400 years more, or about 3000 B.C., the sedimentary record came to an end.—*E. W. Berry.*

2821. Turrill, W. B. T. **Xanthium spinosum in Neolithic deposits in Bulgaria.** Kew Bull. 1923: 190–191. 1923.—A summary is given of previous knowledge of the distribution of *Xanthium spinosum,* usually considered a native of South America. Fossil fruits have been collected from the Pliocene beds in the Tertiary formation of the Pampas. Recently semi-fossilized fruits have been obtained from prehistoric deposits of Neolithic age near the village of Bogorow, 15 km. east of Sofia, Bulgaria. This indicates the existence of the species in southern Europe long anterior to the date heretofore accepted for its introduction.—*T. J. Fitzpatrick.*

2822. Walkom, A. B. **On fossil plants from Bellevue near Esk.** Queensland Mus. Mem. 7^1: 77–92. *Pl. 15–21, 3 fig.* 1924.—The author describes 20 species from Esk, Queensland, which are correlated with the Ipswich series, and considered to be of Rhaetic age. The additions to the Esk flora comprise *Neocalimites hoerensis, Schizoneura* cf. *africana, Cladophlebis lobifolia, Dictyophyllum rugosum, Pecopteris Hillae, Sphenopteris superba, S. pecten, Nilssonia superba, Pterophyllum Nathani, Podozamites lanceolatus, Ginkgoites digitata, G. sibirica, G.* sp., *Baiera bidens,* and unnamed seeds. The *Pecopteris, Nilssonia* and *Pterophyllum* are new species.—*W. D. Francis.*

2823. Walton, J. **The physiological anatomy of the fossil genus Rhexoxylon compared with that of some modern lianes.** (Abstract) Rept. British. Assoc. Adv. Sci. 1922: 396. 1923.

2824. Wieland, G. R. **Recent achievements in paleobotany.** Science 60: 233–235. 1924.—In all the world there are only about 20 workers in paleobotany whose names are listed here. The important discoveries made in the past 35 years are noted, together with the workers who made them. The discovery of "coal balls" in America is considered a most important and promising event. Finally, the author discusses in some detail the evidence that relates to the origin and development of the Medullosans.—*C. J. Lyon.*

2825. Yule, G. Udny. **A mathematical conception of evolution based on the theory of age, size, and space.** (Abstract) Rept. British Assoc. Adv. Sci. 1922: 399. 1923.

PATHOLOGY

Frederick V. Rand, *Editor*

Lillian C. Cash and Harry Braun, *Associate Editors*

(See also in this issue Entries 2125, 2126, 2127, 2143, 2146, 2147, 2150, 2156, 2166, 2178, 2183, 2188, 2189, 2193, 2199, 2207, 2212, 2213, 2218, 2298, 2299, 2307, 2313, 2323, 2385, 2390, 2392, 2394, 2424, 2441, 2487, 2493, 2503, 2512, 2520, 2527, 2528, 2563, 2564, 2565, 2572, 2607, 2650, 2651, 2652, 2663, 2666, 2669, 2678, 2685, 2686, 2688, 2691, 2693, 2696, 2701, 2711, 2714, 2720, 2770, 2773, 2775, 2780, 2792, 2794, 2795, 2796, 2955, 2970, 2996, 3034, 3127)

DISEASES CAUSED BY FUNGI

2826. Adams, J. F. **The use of sulphur as a fungicide and fertilizer for sweet potatoes.** Phytopathology 14: 411–423. *Fig. 1–4.* 1924.—One-half acre and 1 acre plats of various soil types received applications of 200 to 400 pounds of inoculated sulphur, supplementary to various fertilizer treatments. Check plats were similarly treated except that no sulphur was applied. In each of the 8 experiments conducted, sulphur gave a decided increase in yield and also a reduction in scurf (*Monilochaetes infuscans* E. & H.) and pox (*Cytospora batatis* Elliott). Increased yield and decreased infection by the 2 diseases both appeared to be correlated with increased hydrogen-ion concentration. Maximum beneficial results were attained with applications of 300 pounds of sulphur per acre.—*B. B. Higgins.*

2827. Berkeley, G. H., and A. B. Jackson. **Blue stem [Acrostalagmus caulophagus, Lawrence] of black and red raspberry.** [Abstract] Phytopathology 14: 347. 1924.

2828. Bewley, W. F. **Anthracnose of the cucumber under glass.** Jour. Ministry Agric. [England] 29: 469–472. 1922.—This is now the most important leaf spot disease (*Colletotrichum oligochaetum*) of cucumbers in England. Symptoms are described and sources of infection, of which straw manure is perhaps the most important, are discussed.—*Harry Braun.*

2829. Carne, W. M. **Flag smut of wheat (Urocystis tritici.).** Jour. Dept. Agric. Western Australia 2nd. Ser. 1: 142–147. *Fig. 3.* 1924.—This is one of the most serious of the diseases of wheat. The author states that it is possibly even more serious in Australia than stem rust. The type of damage done, cause, method of infection, varieties affected, and methods of control are discussed.—*P. J. Olson.*

2830. Dosdall, Louise. **Factors influencing the pathogenicity of Helminthosporium sativum.** Minnesota Agric. Exp. Sta. Tech. Bull. 17: 1–47. *Pl. 1–6, fig. 1–7.* 1923.—This organism causes a foot-rot and root-rot of cereals and many wild grasses. Growth conditions affect spore length. Studies on the effects of pH showed better spore germination in alkaline solutions. Leaf infection is proportional to the amount of moisture present. No correlation between soil fertility and the root-rot was found in a 1-year's experiment. The widespread occurrence of the fungus is due to its saprophytic response to a wide range of environmental conditions. Injury is local, and is determined largely by the number and size of the lesions; it is favored by high temperatures and is most severe under conditions unfavorable to the growth of the host.—*Harry Braun.*

2831. Fant, G. W. **The manner of infection of peach twigs by the brown rot fungus.** Phytopathology 14: 427–429. 1924.—Two series of inoculations were made to determine

the conditions under which peach twig infection by *Sclerotinia cinerea* occurs, one in early spring and the other in midsummer. Spores of the fungus were suspended in sterile water and placed in small droplets on uninjured twigs of the present and of the previous season's growth. The twigs were then kept moist for several days. No infections occurred except in one case in which the twig was accidentally wounded. These results in connection with field observations indicate that practically all twig infection in the field results from the fungous mycelium passing back through the pedicels of infected blossoms or fruits, or occasionally through infections of wounds of various sorts.—*B. B. Higgins.*

2832. Kelley, Arthur Pierson. **Chestnut trees surviving blight.** Science **60**: 292–293. 1924.—Measurement of recent growth of twigs of *Castanea dentata* showed that they were growing faster than they were being killed by the blight, *Endothia parasitica.* Older trees are also surviving in large numbers in Pennsylvania, New York and Ontario and should be preserved with care.—*C. J. Lyon.*

2833. Курсанов, Л. И. [Kursanov, L. I.] **История и современное состояние изучения Phytophthora infestans de Bary. [History and present situation of the study of Phytophthora infestans de Bary.]** Труды секции по микологии и фитопатологии Русского Ботанического Общества. Труды Московского Отделния [Trav. Sect. Mycol. Phytopath. Soc. Bot. Russie. Trav. Div. Moscow] **1**: 107–118. 1923.

2834. Lindegren, C. C., and Dean H. Rose. **Two hitherto unreported diseases of stone fruits.** Jour. Agric. Res. **28**: 603–605. 1924.—There has been found, on peaches shipped from California, a rot from which a fungus similar to *Botrytis cinerea* has been isolated. It is proved, by inoculation and isolation, that this fungus is the cause of the disease. The inoculation experiments indicate that the fungus is able to penetrate the injured skin of the fruit. —There has been found on sweet cherries shipped from Michigan a rot from which a species of *Alternaria* has been isolated. There is no proof that the species of *Alternaria* from sour cherries is identical with that from sweet cherries, but cross-inoculation and reisolation have shown that both strains are pathogenic to both kinds of cherries. The inoculation experiments indicate that the fungus is unable to penetrate the uninjured skin of the fruit.—*Authors.*

2835. Maneval, W. E. **The viability of uredospores.** Phytopathology **14**: 403–407. 1924.—Host plants, bearing uredospores of several rust fungi, were collected late in the fall, dried, and stored in a cool room (5–15°C.). The viability of these spores was tested at intervals during the following winter and spring. Viable uredospores were present in the various species as follows: *Uromyces striatus* Schr. on *Medicago sativa* L., after 178 days; *U. caryophyllinus* (Sch.) Wint. on *Dianthus caryophyllinus* L., after 185 days; *Puccinia sorghi* Schw. on *Zea Mays* L., after 180 days; *P. coronata* Cda. on *Avena sativa* L., after 164 days; *P. menthae* Pers. var. *americana* Burr. on *Monardia fistulosa* L., after 173 days; *P. amorphae* Curt. on *Amorpha fruticosa* L., after 89 days. These results indicate that under certain conditions hay and straw may serve as a source of spring infection for these forms.—*B. B. Higgins.*

2836. Mariañon, J. A. **A biochemical study of resistance to mildew in Oenothera.** Philippine Jour. Sci. **24**: 369–441. 1924.—(For abstract see this issue, Entry 2607.)

2837. Marlatt, C. L. **Potato wart—statement of policy Feb. 7, 1924.**—Proc. 10th Ann. Meeting Potato Assoc. Amer. *P. 38–39.* 1923. [1924].—At a conference held by the Federal Horticultural Board February 1, with officials of Pennsylvania and Maryland and specialists from the Bureau of Plant Industry, for the purpose of considering future quarantine measures, it was decided that the time had not yet arrived to abandon control measures.—*W. Stuart.*

2838. Millard, W. A., and Sidney Burr. **The causative organism of skin spot of potatoes.** Kew Bull. **1923**: 273–287. *6 fig.* 1923.—This gives an epitome of previous investigations. Then follows a survey of a series of inoculation experiments. Inoculations with pure cultures of *Oospora pustulans* produced typical pustules of skin spot, mainly in and about the "eyes" of the tubers. Inoculations with *Spongospora subterranea* gave corky scab sori but no pustules resembling skin spot. Discrete skin spot pustules and corky scab sori were produced with inocula of *Oospora pustulans* and *Spongospora subterranea* together, thus showing the 2 diseases to be distinct. The appearance and structure of skin spot pus-

tule are constant and characteristic. There is then, no relation between these 2 diseases.—*T. J. Fitzpatrick.*

2839. Pearsall, W. H., and F. A. Mason. **Yorkshire naturalists at Earby.** Naturalist 1924: 181, 249–250. 1924.—*Sclerotinia Curreyana* was plentiful on *Juncus effusus* but in no case was it seen on *Juncus conglomeratus* growing alongside.—*W. H. Burrell.*

2840. Rosen, H. R. **The control of damping off of cotton seedlings by the use of Uspulun.** Science 60: 384. 1924.—A 0.25% solution of Uspulun was applied to moist soil by the use of a sprinkling can. A single application of 1 gallon of solution per square foot of soil prevented further damping off by *Rhizoctonia.*—*C. J. Lyon.*

2841. Schmitz, Henry. **Preliminary note concerning physiological specialization in Fomes pinicola Fr.** Science 60: 248–249. 1924.—Since fungi of the wood-destroying type continue to grow on the same host plant for several years, the chances for the production of specialized strains appear to be very good. It is of practical value to know if the infected trees of one species may be left uncut with safety to different species growing in quantity in the same area. Four strains of *Fomes pinicola* Fr. were obtained from 4 different hosts and were found to differ in growth characteristics, nutritive requirements and enzyme activities. Their wood-destroying properties are now being studied.—*C. J. Lyon.*

2842. Shear, C. L., Neil E. Stevens, and Marguerite S. Wilcox. **Botryosphaeria and Physalospora on currant and apple.** Jour. Agric. Res. 28: 589–598. *Pl. 1–2, fig. 1–3.* 1924.—*Botryosphaeria ribis* G. & D. and *Physalospora malorum* Shear, which have apparently been confused, are here shown to have quite different life histories—*Botryosphaeria* having *Dothiorella* as its pycnidial stage and *Physalospora* having *Sphaeropsis* as its pycnidial stage. A difference is also found in the size of the ascospores of these 2 fungi and in the method of germination of the ascospores. Ascospores of *Physalospora* germinate with a single, long, unbranched germ tube and those of *Botryosphaeria* usually with 2 branched germ tubes. *Botryosphaeria mali* described by Putterill on apple from South Africa is considered to be the same as *Botryosphaeria ribis chromogena* G. & D., the cause of currant cane blight in the U. S. A. The fungus commonly found on apple in the U. S. A., which closely resembles *Botryosphaeria ribis* in morphology but is non-chromogenic in culture, is considered as identical with *Botryosphaeria ribis* G. & D.—*Neil E. Stevens.*

2843. Stakman, E. C., and M. N. Levine. **Puccinia graminis poae Erikss. and Henn. in the United States.** Jour. Agric. Res. 28: 541–548. *Pl. 1.* 1924.—*Puccinia graminis poae* Erikss. and Henn. was definitely identified in the United States for the 1st time in 1923, although the rust has been known for some time in Europe. The host range is narrow. The following species of Poa are susceptible: *Poa annua, P. compressa, P. fertilis, P. nemoralis, P. pratensis, P. triflora.* It has generally been considered that the rust is restricted to the genus Poa, it can also infect barley very weakly. Morphologically, *P. graminis poae* is quite distinct from other varieties of *Puccinia graminis.* The teliospores, urediniospores and and aeciospores are even shorter than those of *P. graminis agrostis,* which were previously considered the shortest of all. It is not known just how widely distributed the rust may be; so far it has been found only near rusted barberry bushes in several of the Lake States.—*E. C. Stakman.*

2844. Stevens, Neil E. **Physalospora malorum on currant.** Jour. Agric. Res. 28: 583–588. *Pl. 1–2.* 1924.—The perfect stage of the Sphaeropsis commonly found on dead currant canes in the eastern U. S. A. is proved by pure culture studies to be a Physalospora which is apparently identical with that found on apple, here called *Physalospora malorum* Shear. The size and structure of the sporocarps bear a direct relation to the host on which they grow. The sporocarps produced on apple are smaller than those on currant, and those produced on small currant twigs with thin bark are smaller than those produced on larger branches with thicker bark. This relation holds both in nature and in pure cultures on sterile twigs. The same difference is found in sporocarps of *Diplodia natalensis* on twigs of apple and currant.—*Frederick V. Rand.*

2845. Stevens, Neil E., and Anna E. Jenkins. **Occurrence of the currant cane blight fungus on other hosts.** Jour. Agric. Res. 27: 837–844. *Pl. 1–2, fig. 1.* 1924.—The currant cane blight fungus (*Botryosphaeria ribis* G. and D.) hitherto known only from *Ribes* spp. is here

reported as occurring on horse-chestnut (*Aesculus hippocastanum*) and various cultivated rose species and hybrids, chiefly those of Chinese origin. The identity of the fungi found on horse-chestnut and rose with the currant cane blight organism was proved by morphological and culture studies and by inoculation on currants. Inoculation experiments also proved that the fungus causes a cane blight of roses. The stromata of the fungus are much larger on currant than on rose.—*Frederick V. Rand.*

2846. Suematu, N. **Ueber eine Botrytiskrankheit der Erdnuss (Arachis hypogaea L.)** [**A Botrytis disease of peanuts.**] Japanese Jour. Bot. **2**: 35–38. *Pl. 3–4.* 1924.—A Botrytis disease of peanuts was observed in the autumn of 1914 causing severe injury to the crop in the fields of the botanical institute at Komaba. The symptoms, a black wet rot of the leaves and stems together with the grey conidial felts on the affected organs and the sclerotia formed on the unripened nuts, correspond in detail with those described by Hanzawa for a disease of peanuts caused by *Sclerotinia Arachidis* Hanzawa. In this case, however, the author did not observe apothecia in connection with the fungus. Since Hanzawa had made no attempt to establish pathogenicity, the fungus was isolated and grown on a variety of media. Vigorous healthy peanut plants growing in pots were then inoculated by spraying with a suspension of conidia in sterilized water. The conidia were from conidiophores recently developed on sclerotia. The plants were covered with bell jars and held at a temperature of 15–20°C. in a half lighted room. Infection occurred on the younger leaves and shoots which were covered with the greyish white mycelium within a week. Conidiophores appeared within 2 weeks, sclerotia finally developing after 18 days. A brief description of the fungus with figures and measurements of the conidia is given. The work of other authors on infection with *Botrytis* is quoted. It was observed in connection with the studies of the fungus in culture that conidiophores are most abundantly produced in petri dishes, while sclerotia predominate in test tube cultures. This the author attributes to the influence of transpiration, as already suggested by Reidenmeister.—*H. H. Whetzel.*

2847. Талиев В. И, и А. И. Григорович. [Taliev, V. I., and A. I. Grigorovich] **К влиянию гологни на растение-хозяина.** [**Influence of smuts upon plant nutrition.**] Труды секции по микологии и фитопатологии Русского Ботанического Общества. Труди Московского Отделения [Trav. Sect. Mycol. Phytopath. Soc. Bot. Russie. Trav. Div. Moscow] **1**: 47–53. 1923.—*Avena Ludoviciana* infected by *Ustilago Avenae* put out new growth more vigorously than did healthy plants of the same species. However, both dry weight and length of stem were less in infected than in healthy plants. (From French summary.)—*Frederick V. Rand.*

2848. Turconi, Malusio. **Una moria di giovani piante di eucalipti.** [**A blight of young Eucalyptus plants.**] Atti Ist. Bot. Univ. Pavia Ser. III, 1^2: 125–135. *Pl. 8.* 1924.—*Physalsopora Eucalyptorum* n. sp., *Macrophoma Eucalyptorum* n. sp. and *Gloeosporium Eucalyptorum* n. sp. are described as causing the death of young Eucalyptus plants, belonging to 11 species, kept in a humid, little-aerated greenhouse at 15°C.—*P. D. Caldis.*

2849. Weiss, Freeman. **The present status of investigation of potato wart and a consideration of its economic importance.** Proc. 10th Ann. Meeting Potato Assoc. Amer. *P. 31–38.* 1923 [1924].—The area of potato-wart-infected land in Germany in 1920 was estimated at approximately 6,250 acres while in the U. S. A. it is estimated at 125 acres. The common method of spread of the disease is through the use of wart-diseased tubers. The use of immune varieties on wart-infested land is also an effective means of control. Soil disinfectants have been used with some degree of success in eliminating the disease and many of them are cheaper and more convenient to apply than steam heat sterilization of the soil. —*W. Stuart.*

DISEASES CAUSED BY BACTERIA

2850. Anonymous. **Celery yellows. Phytopathological notes.** Phytopathology **14**: 435. 1924.—L. F. Butler of the Colorado Agricultural College reports finding 2 species of bacteria associated with celery yellows; but the relation of these organisms to the disease has not been determined.—*B. B. Higgins.*

2851. Boodle, L. A. **The bacterial nodules of the Rubiaceae.** Kew Bull. 1923: 346–348. 1923.—This paper gives the morphology of warts or nodule-like thickenings which occur on the leaves of certain species of *Pavetta* and *Psychotria*, natives of Ceylon. The nodules contain *Mycobacterium Rubiacearum*, a bacterium capable of fixing free nitrogen from the air. The bacteria are also found in the leaf buds and between the embryo and endosperm in the seed, thus causing early infection. The bacteria in the seed may be killed by suitable treatment with hot water, without injury to the seed. The nodules contain a large amount of nitrogenous material which may disappear in old leaves, and probably the bacteria are eventually digested. Leaves with nodules make suitable green manure and are so used by the natives of Ceylon. Similar nodules with bacteria also occur on the leaves of *Ardisia crispa*.—*T. J. Fitzpatrick.*

2852. Cardinell, H. A. **Color indicators for blight disinfectants.** Science 60: 455. 1924.—If fuchsin red is added to the mercury and glycerin solution used on lesions after removal of tissues infected with *Bacillus amylovorus*, the color enables the worker to be certain of having covered all parts of the wound.—*C. J. Lyon.*

2853. Gardner, John S. **Some observations on the use of sulfur to correct scab in potato land in Kentucky.** Proc. 10th Ann. Meeting Potato Assoc. Amer. *P. 158–161.* 1923 [1924].—Four examples are cited of applications of inoculated sulphur or flour of sulphur. The belated action of the sulphur in reducing scab infection is one of the interesting features of the paper.—*W. Stuart.*

2854. Graham, J. Catherine. **Some experiments with sulphur as a control for potato scab.** Proc. 10th Ann. Meeting Potato Assoc. Amer. *P. 161–165.* 1923 [1924].—Experiments were conducted in Prince Edward Island, New Brunswick and at Ottawa, Ontario. Arrangements for tests were also made with the plant pathologists at the Ontario Agricultural College, the Manitoba Agricultural College, and at the Rosthern Exp. Sta. in the Province of Saskatchewan. Each experiment consisted of 10 plots, each of $\frac{1}{40}$-acre area. One experiment showed consistent control of scab with both inoculated and uninoculated sulphur. Two experiments showed consistent increase in the percentage of clean tubers, while 2 others showed a high percentage of clean tubers in all plots. Five experiments showed no consistent variation in the percentage of clean tubers.—*W. Stuart.*

2855. Mallmann, W. L., and Carl Hemstreet. **Isolation of an inhibitory substance from plants.** Jour. Agric. Res. 28: 599–602. 1924.—A substance inhibitory to an organism capable of rotting cabbages was isolated from the same plant from which the organism was obtained. The organism was found to be a member of the fluorescent group. The technique used was similar to that recommended by d'Herelle for isolation of the bacteriophage. The inhibitory substance became active against other soft-rot-producing organisms but this activity was lost by further transplanting. The inhibitory substance was not destroyed at 26°C. for 20 minutes, but was destroyed at 63° for 30 minutes, showing a sensitiveness to heat comparable to microörganisms and lytic substances isolated from animal sources. The inhibitory substance was present in extremely large amounts, as indicated by its activity in high dilution. Lytic and inhibitory substances are probably found in plants as in animals. —*W. L. Mallmann.*

2856. Martin, Wm. H. **Potato scab control investigations.**—Proc. 10th Ann. Meeting Potatoe Assoc. Amer. *P. 127–139.* 1923 [1924].—Data from experimental studies on scab in New Jersey are presented on the following questions: (1) Kind of sulphur to use; (2) time and method of application; (3) rate of application; (4) residual effect; (5) influence of soil and seed treatment; (6) influence of acid fertilizers.—*W. Stuart.*

2857. Robinson, W., and H. Walkden. **Critical observations on crown gall in Chrysanthemum frutescens.** [Abstract.] Rept. British Assoc. Adv. Sci. 1922: 400. 1923.—(See also Bot. Absts. 13, Entry 2816.)

2858. Rosa, J. T. **Effect of sulfur and acid fertilizers on scab in California.** Proc. 10th Ann. Meeting Potato Assoc. Amer. *P. 157–158.* 1923 [1924].—Common scab is a more or less serious disease in California. The data presented is based on a 1-year test at University Farm, Davis. A comparative test was made of the relative merits of inoculated sulphur, sulphur flour, sulphate of ammonia and nitrate of soda, as compared with the check. The

check rows showed 55.9% of scabby tubers; 300 pounds inoculated sulphur, 30.8 %; 300 pounds sulphur flour, 20.8%; 225 pounds sulphate of ammonia, 20%; 300 pounds nitrate of soda, 42.7%, and a second check 56.1%.—*W. Stuart.*

2859. Rosen, H. R. **A bacterial disease of foxtail (Chaetochloa lutescens).** Arkansas Agric. Exp. Sta. Bull. 193. *P. 333–402. Pl. 23–29, fig. 1.* 1924.—(See also Bot. Absts. 13, Entry 7870.) In addition to points already abstracted, the following may be noted. Attention is called to the inadequacy of the present information on sorghum blight (*Bacillus sorghi* Burr.) and of Burrill's bacterial disease of field corn. A bacterial disease of oats is noted which appears to be different from halo blight (*Bacterium coronafaciens* Charlotte Elliott). The bacterial disease of foxtail is compared with 2 other diseases which may be confused with it, namely, spots due to *Cercospora Setariae* and to *Piricularia.* In discussing hosts and extent of injury a large number of different varieties of the common cereals were artificially infected and the seriousness of the disease on oat and barley seedlings was noted. The relation of temperature to infection is studied and it is found that the disease develops only during comparatively high temperatures (85–95°F.). From a study of the morphology of the organism it was found that on certain media adjusted to Fuller's scale, colonies would at times appear, which showed a colorless area bordered by a white precipitate. Attempts to control these characteristics revealed that they were dependent upon the degree of active acidity of the culture media and that titration by the Fuller method had failed to reveal this relationship.—The same thing was also found for another organism, *Bacterium Cannae* Bryan. In nutrient agar testing Ph 6.6, the colorless zone and white precipitate always developed, while on media testing Ph 7 and over, these did not appear. The use of Fuller's method failed to bring out these marked characteristics.—A discussion of H-ion concentration and its relationship to various phases of bacteriology and to various physiological processes is presented. A method is described of measuring pH by comparing a tube of nutrient media plus indicator with a colored chart. Factors involved in the germicidal action of acids are discussed. It is found that acetate and phosphate ions are markedly injurious to the growth of the foxtail organism, that malate and tartrate ions exercise a retarding influence on growth, and that citrate, chloride, and lactate ions have no marked effect on growth. Tables with discussion are given showing changes in the H-ion concentration of inoculated and uninoculated beef broth. Included in the study of the growth of the organism on different media are: A comparison between glass wool and cotton as filtering agents, the use of lima bean agar as a nutrient media for bacteria, a comparison of growth on grass decoctions (from a susceptible as well as from a resistant grass) and a study of amino acids in relation to growth. Experimental results indicate that beef extract, in nutrient agar and whey, are the sources of the white precipitate. Chemical studies indicate that this is a phosphate. Among the physiological reactions of the organism it is noted that smearing a culture over cover glass to test the effect of drying, as commonly practiced, is apt to result in erroneous conclusions. A survey of the literature on bacterial diseases of cereals and a bibliography of about 100 entries are included.—*V. H. Young.*

DISEASES CAUSED BY ANIMAL PARASITES (INSECTS, NEMAS, PROTOZOANS, ETC.)

2860. Anonymous. **Rabbits that bark.** Missouri Bot. Gard. Bull. **12**: 40–41. *Pl. 5.* 1924.—Suggestions are given for the treatment of girdling wounds on plants attacked by rabbits.—*O. T. Wilson.*

2861. Bottel, A. E. **Should box sterilization become general packing house practice?** California Citrograph **10**: 37, 40. *1 fig.* 1924.—This is a statement of the dissemination of citricola, black and red scale and citrophilus mealy-bug in citrus orchards of Riverside County and the expenditure of approximately $650,000.00 there during the past 3 seasons to combat these insects. It is believed that "clean" orchards are frequently inoculated by the use of picking boxes which have been used previously in infested groves. A machine is described which subjects the boxes to live steam at 200–210°F. for at least 2 minutes and gives 100% fatality to insects even in an undeveloped stage.—*C. S. Pomeroy.*

2862. Buchet, S. **Cladomanie et castration parasitaire de Reseda lutea L.** Bull. Soc. Bot. France **70**: 301–303. 1923.—The curculionid, *Baris picicornis* Marsh. causes marked

stunting and virescence in the flowers of *R. lutea* L. The anthers are underdeveloped and do not open. Others have reported larvae of the Curculionidae causing virescence in clover and deformations in *Melilotus arvensis, Sinapis arvensis, Cardamine pratensis, Pulicaria dysenterica, Senecio Jacobaea,* etc.—*P. A. Young.*

2863. Froggatt, J. L. **Banana weevil borer.** Queensland Agric. Jour. 21: 369–378. *Pl. 66–67.* 1924.—This is the 6th progress report of an investigation of the life history of *Cosmopilites sordidus* and its effects upon the banana plant. Various phases of the development of the insect and its effects upon banana suckers are illustrated.—*W. D. Francis.*

2864. Froggatt, J. L. **Banana weevil borer.** Queensland Agric. Jour. 22: 154–156. 1924.—This is a summary of previously recorded observations on *Cosmopolites sordidus.*—*W. D. Francis.*

2865. Froggatt, J. L. **Entomological notes.** Queensland Agric. Jour. 21: 120–123. *3 fig.* 1924.—Notes of the following moths, which are cotton pests, are given: *Chloridea obsoleta, Dichocrocis punctiferalis, Erias huegeli, Agrotis radians* and *Cosmophila xanthindyna.* A few plant-eating beetles, plant bugs, locusts and termites are also referred to. The cotton stainer (*Dysdercus sidae*) and the Chinese bug (*Tectacoris banksii*) are figured.—*W. D. Francis.*

2866. Girault, A. A. **The orange-tree bug.** Queensland Agric. Jour. 21: 57–78. *Pl. 1–4.* 1924.—Recent investigations of *Oncoscelis sulciventris* in Queensland are detailed.—*W. D. Francis.*

2867. Girault, A. A. **The orange tree bug (Oncoscelis sulciventris Stål.).** Supplementary Notes. Queensland Agric. Jour. 22: 25–26. 1924.—Additional descriptive life history notes are given. [Ibid 21: 57–78. 1924.]—*W. D. Francis.*

2868. Godfrey, G. H. **Dissemination of the stem and bulb infesting nematode Tylenchus dipsaci, in the seeds of certain composites.** Jour. Agric. Res. 28: 473–478. *3 pl.* 1924.—Earlier observations on the occurrence of the stem nematode in *Hypochaeris radicata* had led to the belief that the only plausible expanation for the widespread occurrence of the nematode on this host was its wind dissemination with the seed. This belief was substantiated by studies of plants in different stages of development. Nematodes were seen to have penetrated the young flower heads in the crown of the plant; to have multiplied within the tissue of the flower head as the flower developed; and to have worked their way from the heavily infested receptacle into the young seed, there to remain, in some cases, until the seed were mature. Mature seed carrying a pappus and capable of growth, were found containing living nematodes. Such seed when planted produced seedlings that were infested in their primary and secondary leaves. A similar condition was found to exist in *Taraxacum officinale;* diseased plants were found in abundance in western New York, in Ontario, Canada, and at Boston, Massachusetts. *Crepis virens* is reported as a new host record for the same nematode. No doubt this species, as well as others of the many composites reported to be hosts for *Tylenchus dipsaci* in Europe, help to disseminate the organism by means of their seed.—*Author.*

2869. Holdaway, F. G. **Recent observations on insects injurious to cotton.** Queensland Agric. Jour. 21: 79–80. *Pl. 8.* 1924.—This is a report on 2 insects, *Agrotis* sp. and *Neocleptria punctifera,* which attack the foliage of cotton seedlings.—*W. D. Francis.*

2870. Howe, L. J. **Choosing a time for fumigation.** California Citrograph 5: 347, 368, 369. 1920.—This is a statement by a horticultural inspector regarding the control of black scale (Scutellista cyanea) and purple scale in citrus groves. The most desirable season of the year for fumigation is indicated, as well as the proper time in the development of the scale organism.—*C. S. Pomeroy.*

2871. Jarvis, Edmund. **Melolonthid beetles affecting sugar cane.** Queensland Agric. Jour. 21: 322–324. *1 col. pl.* 1924.—Descriptions and colored figures of 8 species are given.—*W. D. Francis.*

2872. Jarvis, Hubert. **Fruit fly investigations. Entomologist's report.** Queensland Agric. Jour. 21: 382–385. 1924.—This is a progress report of a special investigation of the fruit fly (*Chaetodacus tryoni*) in the Stanthorpe District.—*W. D. Francis.*

2873. Jarvis, Hubert. **Fruit fly investigations. Entomologist's report.** Queensland Agric. Jour. 22: 110–112. 1924.—This is a progress report of the investigation of *Chaeto-*

dacus tryoni in the Stanthorpe District. The effects of cold on the adult fruit flies, the occurrence of the fly in native fruits and the occurrence of puparia under cultivated fruit (apples) are discussed.—*W. D. Francis.*

2874. Simmonds, J. H. **A new cotton pest.** Queensland Agric. Jour. **21**: 187–191. *Pl. 36–39.* 1924.—A Chrysomelid beetle, *Rhyparida australis*, and its injurious effects on cotton plants are described.—*W. D. Francis.*

2875. Speare, A. T., and W. W. Yothers. **Is there an entomogenous fungus attacking the citrus rust mite in Florida?** Science **60**: 41–42. 1924.—Shortly after the time of maximum infestation of citrus rust mites (*Phyllocoptus oleivorus* Ashm.), they suddenly disappear. Observations on masses of dead bodies have shown that there is a marked discoloration. Previous to death the adult mites changed from lemon yellow to orange yellow in color and appeared sluggish. Fungal filaments have been found protruding from dead bodies. The use of copper sprays allows the rust mites to become more abundant. All the evidence points to the presence of a fungus on the mites in Florida.—*C. J. Lyon.*

2876. Tryon, Henry. **Orange-piercing moths (Fam. Ophiderinoe).** Queensland Agric. Jour. **21**: 385–397. *Pl. 71–75.* 1924.—Descriptive notes of *Othreis fullonica, Maenas salaminia* and *Argadesa materna* are given. The damage inflicted by these moths upon orange fruit is discussed.—*W. D. Francis.*

2877. Woglum, R. S. **Factors influencing fumigation results.** California Citrograph **5**: 345. 1920.—This is a brief statement regarding the control of black scale in citrus groves in southern California. The factors discussed are off-hatch of the scale, temperature conditions, heavy cover crop in the orchard, resistant strain of scale, use of an insufficient dosage, poor equipment and careless work. Liquid hydrocyanic acid has given results as satisfactory as the solid material.—*C. S. Pomeroy.*

INFECTIOUS CHLOROSES (MOSAIC AND PEACH YELLOWS GROUPS, ETC.)

2878. Folsom, Donald. **Advances in the study of the virus diseases of Irish potatoes in 1923.** Proc. 10th Ann. Meeting Potato Assoc. Amer. *P. 39–42.* 1923 [1924].—The author discusses nomenclature, etiology, symptoms, and control. An extensive literature is cited. —*W. Stuart.*

2879. Folsom, Donald, and E. S. Schultz. **The importance and natural spread of potato degeneration diseases.** Maine Agric. Exp. Sta. Bull. 316. *1–28. Fig. 1–5.* 1924.—In replicated plots planted, respectively, with diseased and healthy parts of the same commercial Green Mountain strain, spindle-tuber reduced the yield rate from 1.922 ± 0.019 pounds to 1.557 ± 0.016 pounds per hill and from 393.2 ± 3.5 bushels to 309.0 ± 3.9 bushels per acre, or about 20%, while mild mosaic reduced the yield rate about 30%. Still greater reduction resulted from spindle-tuber in Irish Cobblers.—About 200 samples from 35 commercial fields showed that, in 1922, one or both of these diseases had spread, in some places having done so enough to infect half the plants in the first 5 healthy rows next to diseased rows, and in other places spreading across the healthy field as far as the 40th or 50th row. Hill-to-hill spread in a partly diseased field was also common. Of several hundred mosaic tuber-units, about 8% were only partly diseased. With spindle-tuber, about 2% were only partly diseased. —*Donald Folsom.*

2880. Johnsom, James, and Maurice Mulvania. **A new method of obtaining mosaic "virus".** Science **60**: 19. 1924.—The contents of vascular tissues were forced from the hydathodes or cut ends of succulent plants affected with mosaic by subjecting the roots to a high hydraulic pressure. This liquid was found to contain the "virus." No conclusive results were obtained as to the presence of an organism therein.—*C. J. Lyon.*

2881. Kunkel, L. O. **Further studies on the intracellular bodies associated with certain mosaic diseases.** Bull. Exp. Sta. Hawaiian Sugar Planter's Assoc. Bot. Ser. **3**: 108–114. *Fig. 1–2.* 1924.—Observations are made concerning the intracellular amoeboid bodies found associated with the mosaic disease of *Hippeastrum equestre, Zea mays*, Chinese Cabbage (*Brassica pekinensis*), sugar cane (*Saccharum officinarum*), and tobacco (*Nicotiana tabacum*).—*J. M. Westgate.*

2882. Kunkel, L. O. **Studies on the mosaic of sugar cane.** Bull. Exp. Sta. Hawaiian Sugar Planters' Assoc. Bot. Ser. 3: 115–167. *Pl. 1–6, (1 col.), fg. 1–19.* 1924.—Chlorotic areas on the leaves, the pattern of which is identical on both upper and lower sides of the leaf, is the most striking symptom. Mosaic is one of the serious diseases of sugar cane in Hawaii, was first noted in 1908 and is now widely prevalent on all the islands. Attention is given to the development of the chlorotic areas, the transmission of the disease (principally by the corn aphid (*Aphis maidis*), and susceptibility of different commercial varieties of sugar cane as well as other species of grasses, to the disease.—*J. M. Westgate.*

2883. Murphy, Paul A., and Robert McKay. **Investigations on the leaf-roll and mosaic diseases of the potato.** Jour. Dept. Agric. Ireland 23: 344–364. *Fig. 1–10.* 1924.—Dissemination of these diseases was apparently not due to aphids alone. Degeneration is chiefly due to "virus" diseases affecting healthy stock or becoming more common in diseased plants by the increase in the number of diseases per plant. There are at least "three specific diseases contained within the ordinary conception of mosaic," namely, mosaic (simple), crinkle, and leaf-drop (streak or stipple-streak). Mosaic is masked by leaf-roll, may disappear temporarily, and is masked and modified, as to symptoms, by certain varieties. One seedling in a lot of 59 was infected with leaf-roll through the true seed.—Other types of diseases are being investigated but their specific nature is uncertain. In only 1 experiment (by Murphy in Canada) has the effect of the place of origin been tested with disease-free stock; here, origin affected the yield rate.—In Ireland, yield rate is in inverse proportion to leaf-roll percentage. A reliable diagnosis of disease from tuber symptoms or specific gravity of tubers was not disclosed in a study of 1400 tubers. Removal of diseased hills did not eliminate leaf-roll or mosaic. Immunity to wart disease is not lost when leaf-roll or mosaic is present.—*Donald Folsom.*

2884. Patch, Edith M. **The buckthorn aphid.** Maine Agric. Exp. Sta. Bull. 317. *29–52. Fig. 6–8.* 1924.—*Aphis abbreviata* Patch, overwintering on *Rhamnus*, transmits mild mosaic of potatoes. Among its summer food plants in Maine are at least 8 families containing plants subject to 1 or more types of aphid-transmitted mosaic. Among them the following genera are noted: *Solanum, Beta, Brassica, Phaseolus, Trifolium, Nicotiana* and *Cucumis.*—*Donald Folsom.*

2885. Smith, C. E. **Transmission of cowpea mosaic by the bean leafbeetle.** Science 60: 268. 1924.—Experiments with controlled cultures proved that cowpea mosaic is spread by the leaf-beetle, *Ceratoma trifurcata* Forst., which is often found on cowpeas.—*C. J. Lyon.*

2886. Storey, H. H. **The transmission of a new plant virus disease by insects.** Nature 114: 245. 1924.—Reference is made to a condition in maize in Natal similar to, but not identical with, the well-known mosaic disease of sugar cane, maize and other grasses. Transfer was effected by a leafhopper, an undescribed species of *Balclutha.* Transmission of the ordinary mosaic was obtained by Aphis maidis Fitch, which, however, failed to carry the new disease. Infection of other grasses with the latter disease has not been secured.—*O. A. Stevens.*

NON-PARASITIC DISEASES

2887. Bennett, J. P., and E. T. Bartholomew. **The respiration of potato tubers in relation to the occurrence of blackheart.** California Agric. Exp. Sta. Tech. Paper 14: 1–40. *Pl. 1–3.* 1924.—Following up some previous work on the artificial production of blackheart of the potato, the authors report a study of the relationship of temperature, time and O_2 supply in the production of this condition. Potato tubers were placed in air-tight jars, there being a definite ratio between volume of tubers and volume of air. Each series was kept at a given temperature. At intervals, varying from 1 hour for the series at the highest temperature to 1 week for that at the lowest, 1 or more of the containers were removed, the air within was analyzed for O_2 and CO_2 and the tubers were cut and observed. The varieties used were Rural New Yorker, Green Mountain Jr. and Netted Gem. Injury resulted when anaerobic conditions were brought about, the time when the injury showed itself being governed by the rate of respiration. The authors think it probable that any supply of O_2 less than that necessary to maintain free O_2 in the atmosphere surrounding the tubers for more than

⅓ of their storage period would be liable to result in blackheart. At the high temperatures, the varieties differed somewhat in injury, and this is attributed to the varying factor of the permeability of the skin, which affected the rate of respiration. As the temperature was lowered longer periods of confinement were necessary to produce injury, until 5°C. was passed. At this point the rate of respiration appeared to be at a minimum—the result of an equilibrium between the decreasing effect of a lower temperature and the increasing effect of a larger sugar content. This view was borne out by the fact that tubers exposed to low temperatures until they had accumulated sugar in their tissues were more easily injured by high temperatures than non-sweet tubers.—A bibliography is given.—*Margaret Buvens.*

2888. Guillaumin, A. **Notules tératologiques. [Teratological notes.]** Bull. Soc. Bot. France 70: 517–519. 1923.—The author describes abnormalities in the following plants: *Streptocarpus Rexii* Lindl., *Campanula pyraversi* Cayeux, *Anemone fulgens* J. Gay and *Tulipes pluriflores.*—*P. A. Young.*

2889. Guillaumin, A. **Notules tératologiques, II. [Teratological notes, II.]** Bull. Soc. Bot. France 70: 850–851. *1 fig.* 1923.—A flower of *Cypripedium* × *Crossianum* Reichb. var. *superbum* presented the curious phenomenon of twisting, complicated by division and fusion of certain parts.—*Lillian C. Cash.*

DISEASES OF UNKNOWN CAUSE

2890. Darnell-Smith, G. P. **"Bunchy top" disease in bananas.** Queensland Agric. Jour. 21: 169–179. 1924.—The symptoms and possible causes of the disease are discussed. (See also Bot. Absts. 13, Entry 3712.)—*W. D. Francis.*

2891. Dauphiné, André. **Accélération évolutive du convergent dans une racine pathologique de fève. [Acceleration in development of the vascular ring in an abnormal bean root.]** Bull. Soc. Bot. France 69: 334–340. *Pl. 1–2, fig. 1–2.* 1922.—An abnormality of unknown origin in the growing point of the root of a germinating bean caused the development of a cavity in the meristem of the central cylinder and the destruction of elements corresponding to 2 of the vascular bundles. This injury caused an acceleration in the development of the vascular ring in the younger tissues.—*Lillian C. Cash.*

2892. Kunkel, L. O. **Histological and cytological studies on the Fiji disease of sugar cane.** Bull. Exp. Sta. Hawaiian Sugar Planters' Assoc. Bot. Ser. 3: 99–107. *Fig. 1.* 1924.—Fiji disease is an obscure plant malady. It occurs as elongated swellings or galls on the under surface of the leaves. The disease has been reported from Fiji, New Guinea, Australia, and the Philippines but not from the Hawaiian Islands. Peculiar intra-cellular bodies are associated with the diseased areas. These bodies divide and appear to grow, thus indicating a parasitic organism. The pseudopodia-like appendages resemble certain amoebae. The disease is infectious and no other causal agent is in evidence. The studies recorded have not shown a relationship to any other known plant disease. The galls differ from insect produced galls in that the infection apparently spreads through the vascular tissues of the host. Certain analogies exist between this disease and the mosaic disease of sugar cane.—*J. M. Westgate.*

GENERAL AND MISCELLANEOUS PATHOLOGICAL LITERATURE

2893. Anonymous. **Physiological aspects of parasitism.** Nature 114: 231–232. 1924.—This is a brief report of the presidential address of V. H. Blackman to Section K (Botany) at the British Association meeting.—*O. A. Stevens.*

2894. Anonymous. **The Imperial mycological conference.** Nature 114: 207–208. 1924. —This is a report of a meeting at South Kensington on July 2.—*O. A. Stevens.*

2895. Anonymous. **The Uba cane controversy.** Australian Sugar Jour. 16: 392. 1924.—The author gives as a contribution to the Uba cane controversy the following quotation from a letter from the General Secretary of the South African Sugar Association: "The Uba cane, inefficient in many other respects, at least offers little attraction to insect pests. We have Mosaic in every other cane except Uba (the acreage is insignificant), and Uba now shows a streak disease which is a serious factor in reducing tonnage."—*Nellie E. Fealy.*

2896. Anonymous. [Rev. of: Barker, J. Ellis. **Cancer: how is it caused; how it can be prevented.** (With introduction by W. Arbuthnot Lane.) *432 p.* E. P. Dutton Co.: New York; John Murray: London, 1924.] U. S. A. Naval Med. Bull. 21: 867–868. 1924.—The reviewer states that this is a veritable storehouse of information on cancers.—Just how tenable is Baker's theory that cancer is due to chronic poisoning and vitamin starvation, time alone will prove; it at least deserves serious consideration.—*Frederick V. Rand.*

2897. Arnaudi, Carlo. **Le malattie delle patate in Italia.** [Potato diseases in Italy.] Atti Ist. Bot. Univ. Pavia Ser. III 1²: 71–75. 1924.—*Phytophthora infestans* is the most widely spread parasite of potatoes in Italy, causing great damage. *Vermicularia varians* Ducomet, *Spondylocladium atrovirens* and *Rhizoctonia solani* also cause trouble. *Alternaria solani*, *Bacillus solaniperda*, and *Fusarium solani* are of secondary importance.—*P. D. Caldis.*

2898. Bigot, A. **Différents procédés de coloration des cryptocoques pathogènes en médecine vétérinaire.** [Various methods of staining pathogenic Cryptococci in veterinary medicine.] Bull. Soc. Path. Exotique 17: 547–551. 1924.—The 2 Cryptococci of chief importance in veterinary medicine can be readily stained. After prolonged fixation by the method of Bouin-Duboscq, the following stains gave satisfactory results: Gram, Mann, anilin water-safranin, haem-alum, haematin of Tribondeau, eosin, panotique, and Giemsa.—*Philip Brierley.*

2899. Blanc, Georges, et Louis Caillon. **Sur une mycose aspergillaire observée en Tunisie.** [Mycosis due to Aspergillus.] Bull. Soc. Path. Exotique 17: 343–345. *Fig. 1.* 1924.—An unidentified Aspergillus was recovered from a human hand.—*Philip Brierley.*

2900. Bolle, P. C. **Die durch Schwärzepilze (Phaeodictyae) erzeugten Pflanzenkrankheiten.** [Plant diseases caused by Phaeodictyae.] Mededeel. Phytopath. Lab. Willie Com. Scholten 7. *1–74. 3 pl.* 1924.—The author tries to clear the confusion, that exists among many species and genera of the Phaeodictyae. She distinguishes *Alternaria* Nees, *Macrosporium* Berk. [nec *Macrosporium* Fr.] and *Stemphylium* Wallr. The genus *Sporodesmium* Lk. cannot be maintained among the Phaeodictyae. The author gives symptoms, with which one always may distinguish the genera above mentioned. Only in the genus *Macrosporium* were perithecia found; pycnidia were never observed here, nor in the other genera. The perithecial form of all the Macrosporia examined is *Pleospora herbarum* (Pers.) Rbh. The species *Pleospora herbarum* may be divided into several morphological-physiological forms that, however, can be practically distinguished only with much difficulty. The conidial forms, *Macrosporium sarciniforme* Cav., *M. parasiticum* Thüm. and *M. sarcinula* Berk. differ only physiologically in respect to the host plants; the perithecial forms are to be distinguished also by the different measurements of the ascospores. This difference appears, however, only by measuring at least 200 spores of each form.—Of the plant diseases due to members of the above mentioned genera, the author has examined those on *Cruciferae*, on potato and other Solanaceae, blackrot of *Daucus Carotae* and the so-called Sporidesmium disease of *Beta vulgaris*. The author shows that there are 2 species of *Alternaria* that may cause leafspots on cabbage: *Alternaria Brassicae* (Berk.) Bolle [nec *A. Brassicae* (Berk.) Sacc.] and *Alternaria circinans* (B. & C.) Bolle. *A. circinans* causes spots with a conidial layer darker than that on the spots due to *A. Brassicae*. *A. Brassicae* may also cause dry spots on leaves, stems and pods of several Cruciferae, for example, the dry spot disease of rape-seed (*A. Brassicae* (Berk.) Bolle = *Sporidesmium exitiosum* Kühn). On potato, a dry spot disease is caused by *A. Solani* (E. & M.) J. & Gr. *A. tenuis* Nees = *A. fasciculata* (C. & E.) J. & Gr. has often been confused with *A. Solani*. Also, *A. Cheiranthi* (Fr.) Bolle and *Stemphylium Ilicis* Tll. may occur saprophytically on potato leaf spots. The author finds that *A. radicina* M. D. E. does not at all confine itself to storage-rots but may become a dangerous parasite, as it may attack the plants at various ages and on different parts. The so-called Sporidesmium disease of *Beta vulgaris* is considered by the author to be a symptom of old age, as when several saprophytic Phaeodictyae develop on weak or dead parts of the leaves. This mixture of fungi (*A. tenuis*, *A. Cheiranthi*, *M. sarcinula*, *Cladosporium herbarum*) hitherto has been grouped under the name, *Sporidesmium putrefaciens* Fuck.; this name should, therefore, disappear. The different stages of development of this phenomenon are described.—A great many cross inoculations were made on related plants with the different fungi in question.—All species were studied in single spore-cultures.—*Author.*

2901. British Empire Exhibition, London. **Plant diseases and pests.** Malayan Ser. 9. *1–42.* Fraser & Neave, Ltd.: Singapore, 1923.—This popular account deals with diseases and pests of Malayan economic plants.—The diseases of *Hevea brasiliensis* discussed include (1) root diseases—*Fomes lignosus (semitostus)*, *Sphaerostilbe repens*, *Ustulina zonata*, *Phomes pseudo-ferreus* (wet-root rot), and brown root disease; and (2) stem and branch diseases —*Corticium salmonicolor*, *Diplodia cacaoicola*, *Phytophthora* spp., *Sphaeronema fimbriatum* brown bast, and spotting of prepared rubber.—The diseases of coconut palms include Malayan bud-rot (cause undetermined), *Pestalozzia palmarum*, and *Helminthosporium incurvatum* —Other crops are briefly mentioned, and insect pests and their control are discussed in some detail.—*Frederick V. Rand.*

2902. Cottrell-Dormer, W. **Bureau of Sugar Experiment Stations: field reports. Diseases and insect pests.** Queensland Agric. Jour. *22*: 146–148. 1924.—Insect pests and the following diseases in the sugar growing districts of Queensland are discussed: Leaf scald, leaf stripe and rust (*Puccinia* (*Uromyces*) *Kuhnii*).—*W. D. Francis.*

2903. Cottrell-Dormer, W. **Cane pests and diseases. Report on Babinda areas.** Australian Sugar Jour. 16: 327, 329–330. 1924.—Leaf scald, leaf stripe, top-rot, and root disease were observed in the District of Babinda during the month ending July 15. Leaf scald, while doing little damage generally, is a source of great potential danger. Destroying all stools showing the characteristic symptoms while they are young would do much toward exterminating this disease. Badly affected stools can be easily recognized by the light-green and white-striped coloring of the outer leaves and the almost pure white of the innermost leaves. Affected leaves are stunted and curled at the tips and often look as though they had been scalded. The disease was particularly severe on cane that had previously received a severe check.—Leaf stripe was observed on 1 block of B. 208; and on 1 farm top-rot caused severe damage to Badila cane. Throughout the district, Badila was found more or less affected by what may probably be a root disease. In many respects the trouble resembles top rot, but differs from the latter in that the leaves do not usually turn yellow and die, but remain stunted and green, though dead tops are occasionally seen. "Trashing of affected cane three or four months previous to cutting has helped it on a great deal." E. K. 28 is very susceptible to leaf spot, *Cercospora* spp.—*Nellie E. Fealy.*

2904. Cottrell-Dormer, W. **Diseases and pests of sugar cane.** Australian Sugar Jour. 16: 379–380. 1924.—Leaf scald was found on cane in the South Johnstone, Banyan, Mourilyan, and Goondi districts. Crops in which this disease is present should not be used for seed. Where there is difficulty in obtaining seed the selected block should be examined fortnightly or tri-weekly and all stools showing suspicious markings destroyed.—Rust, due to *Puccinia Kuhnii*, was more or less prevalent throughout the districts named. The characteristic markings consist of short orange to dark-brown longitudinal streaks, the length varying with the variety. The orange color is due to the presence of large numbers of the spores of the fungus causing the disease, and the streaks, which are wounds in the outer skin of the leaf, are caused by the bursting of the skin due to swelling of the spores. The wounds are more numerous on the under side. Mature spores are gray, quite loose and ready for transportation by insects to other leaves or stools. Healthy canes are able to resist infection, but weaker canes readily succumb. Crops showing much rust should not be used for seed. —*Nellie E. Fealy.*

2905. Cottrell-Dormer, W. **Sugar pests and diseases in the Mackay District.** Queensland Agric. Jour. 21: 363–368. 1924.—The following diseases are discussed: knife-cut, mosaic, bleeding, bunchy top and leaf stripe (Solorospora sacchari).—*Harry Braun.*

2906. Cottrell-Dormer, W. **Sugar pests and diseases in the Mackay District.** Queensland Agric. Jour. 21: 428–434. 1924.—Notes are given on top-rot and an unnamed disease causing stunting and characteristic leaf markings.—*Harry Braun.*

2907. Du Bois, Eugene F. **Basal metabolism in health and disease.** *372 p. 79 fig.* Lea & Febiger: Philadelphia and New York, 1924.—The subject is treated from the standpoint of those engaged in the practice of medicine and surgery, for medical students, physiologists and dietitians. The underlying principles of technic in measuring basal metabolism are fully discussed although the instruments used in the different procedures are not described

in detail. The 1st part of the book deals with metabolism in health, the 2nd with metabolism in disease.—*Lillian C. Cash.*

2908. Fabricius, J. C. **Forsög til en afhandling om planternes sygdomme.** [A paper on plant diseases.] Kgl. Norske Vidensk. Selsk. Skrift 5: 431–492. Copenhagen, 1774. (English translation, typewritten, U. S. A. Dept. Agric. Library, 1924.)

2909. Fawcett, H. S. and H. J. Ramsey. **Observations on lemon decays at eastern markets.** California Citrograph 10: 12, 22. 1924.—This is a discussion of decays found on lemons on arrival at eastern markets and in dealers' stores. Over 20 kinds or groups of decays or "spots" are mentioned and the factors causing or favoring their development are discussed.—*C. S. Pomeroy.*

2910. Gardner, John S. **Some observations on the control of rots contracted by cut seed potatoes in cold storage.** Proc. 10th Ann. Meeting Potato Assoc. Amer. *P. 187–190.* 1923 [1924].—It has been the practice of a large percentage of the potato growers of Jefferson County, Kentucky, to cut late in January and to keep in cold storage seed potatoes intended for planting in late July or early August. A survey of storage conditions showed that where the storage room was reasonably cool (45°F.), it did not matter much whether the cut seed was dried off or whether it went into storage immediately after cutting. If higher temperatures prevailed rot was more likely to cause damage. Seed potatoes intended for storage should not be cut in a warm room. The temperature in the storage house should preferably be 35–37°F.—*W. Stuart.*

2911. Hoffman, A. H. **A miniature copper carbonate duster.** Jour. Amer. Soc. Agron. 16: 482–483. *Fig. 1.* 1924.—A photograph and description of the duster are given.—*F. M. Schertz.*

2912. Murray, J. C. [**Report of the southern field assistant to the Director of the Bureau of Sugar Experiment Stations**]. Australian Sugar Jour. 16: 331–333. 1924.—Information relative to kinds of cane grown in different southern districts, condition of crops, etc., is given, with suggestions relative to plant selection, fertilizing, and changing plants. "Striped leaf disease" occurred at intervals in the Yandina-Maroochy Districts. Growers should be careful not to use affected cane for planting. The areas mentioned are free from the gumming disease, but plants are being introduced from the northern rivers of New South Wales, where the disease is prevalent. Apart from the gum exuding on the cut surface of affected cane plants, the tops of these plants will be found to be rotten or dead and the shoots dry and snuff-colored. In the Bingera District an indigenous fungoid parasite is attacking the roots of the 1900 seedlings in cases where cane is backward because of poor soil conditions. Planters in the Mackay District are advised against planting E.K.1, as it "is apparently susceptible" to mosaic disease. A sooty fungus was prevalent on leaves of some stools of Uba in this district, and, while harmless in itself, it doubtless prevents the leaf from functioning properly.—*Nellie E. Fealy.*

2913. Orton, Clayton Roberts. **Seed-borne parasites—a general consideration of the problem.** Science 59: 539–546. 1924.—The problem is considered with special reference to its relation to agriculture. The importance of plant protection is first brought out by statistics on crop losses in the United States. Many plant diseases have been introduced from other continents and have spread rapidly. In a large number of cases it has been shown that they are disseminated by infected seed. Such parasitic diseases are of either plant or animal causation. This paper treats of the former and outlines the general features of the mode of action of bacteria and fungi, methods of testing seed to detect their presence, seed disinfection, etc. Numerous research methods and problems are suggested.—*C. J. Lyon.*

2914. Poeteren, N. van. **Verslag over de werkzaamheden van den plantenziektenkundigen dienst in het jaar 1923.** [**Annual report of the (Dutch) Phytopathological Service for 1923.**] Verslag. en Mededeel. Plantenziektenk. Dienst Wageningen 34. *1–66. 3 pl.* 1924.—This report contains notes, observations, studies on, and control measures against the following diseases of plants. (1) Wheat: *Ophiobolus herpotrichus* Sacc., stinking smut, perchlorate poisoning, *Dilophospora graminis* Desm., and *Tylenchus scandens* Schn. (2) Barley: *Helminthosporium gramineum.* (3) Oats: *Heterodera schachtii* Schm., and *Tylenchus devastatrix* Kühn. (4) Rye: *Leptosphaeria herpotrichoides* d. Not. (5) Potato: premature tuber

formation, frost injury, *Tylenchus devastatrix* Kühn, perchlorate injury, potassium hunger, internal brown spot, leaf-roll, and mosaic. (6) Beets: *Phoma betae* Fr., *Bacillus tabificans* Del., and *Oöspora scabies* Thax. (7) Peas: *Peronospora Viciae* de By., *Sclerotinia libertiana* Fuckel and black heart. (8) Clover: *Sclerotinia trifoliorum* Eriks. (9) Rape: *Botrytis cinerea* Pers., and *Leptosphaeria napi* Sacc. (10) Cabbage: *Phoma oleracea* Sacc., *Phyllosticta Brassicae* West., and storage bacterial diseases. (11) *Allium porrum: Botrytis cinerea* Pers. (12) Carrot: *Fusarium* sp. *Aphelenchus modestus* de Man. (13) Bean: *Gloeosporium* (*Colletotrichum*) *Lindemuthianum.* (14) Asparagus: *Fusarium* sp. (15) Tomato: *Ascochyta* or *Diplodina,* injury from steam sterilised soil, and *Rhizoctonia solani* Kühn. (16) *Hortensia: Ascochyta.* (17) Lily: *Rhizoctonia solani.* (18) Tulips: failure of bulbs to come up. (19) Muscari: *Sclerotinia bulborum* Wakker. (20) *Galanthus: Botrytis galanthina* Lud. (21) *Gladiolus: Urocystis gladioli* Winter, or *U. colchici* Schl. (22) *Chamaecyparis: Pestalozzia funera* Desm. (23) Plane-tree: *Gloeosporium nervisequum* Sacc. (24) Flax: *Botrytis.* (25) Flower bulbs: *Penicillium.* (26) Elm: wilt and die-back. (27) Raspberry: *Fusarium* sp. and (28) Currant: die-back.—*D. Atanasoff.*

2915. Sears, H. J., R. W. Garhart, and D. W. Mack. **A milk borne epidemic of typhoid fever traced to a urinary carrier.** Amer. Jour. Public Health **14:** 848–854. *3 fig.* 1924.—An epidemic of typhoid fever in Portland, Oregon, in which 26 cases and 5 deaths occurred, was traced to a carrier employed as a milker in a dairy. This individual constantly excreted large numbers of *Bacillus typhosus* in the urine. The seminal vesicles seem to have been the focus of infection. Treatment in a hospital failed to cure him of this condition.—*C. A. Ludwig.*

2916. Spierenburg, Dina. **Kool: Rotstronken, Stippel- en Randjeskool. [Cabbage storage diseases.]** Verslag. en Mededeel. Plantenziektenk. Dienst Wageningen 35. *1–12. 9 pl.* 1924.—Cabbage in storage often undergoes distinct pathologic changes, which make it unfit for sale or consumption. A number of distinctly different pathologic changes are described. In one case there appeared small dark dots on all leaves down to the heart of the head. In other cases black spots appear only along the margins of the leaves. Often the margins of the leaves die and turn brown. Black spotting of the leaves near and along the main vein, in which case all tissues of the vein become dark colored, represents a 4th group of symptoms. A blackening of the leaves here and there in star-like spots throughout the whole head, is also described. In some instances the discolorations are limited only to the main veins; in this case only the upper 2 layers of cells are affected. A soft rot of cabbage is also described. In all cases bacteria were observed in the cells of affected areas. In 2 instances *Peronospora parasitica* was also present. Bacteria isolated from diseased cabbage produced typical black spotting of the leaves following inoculation.—*D. Atanasoff.*

2917. Weiss, Freeman, and Philip Brierly. **Report of research committee.—A summary of the present status of investigation of the parasitic diseases of the potato, with special references to advances made in 1923.** Proc. 10th Ann. Meeting Potato Assoc. Amer. *P. 21–31.* 1923 [1924].—This is a concise review of recent additions to our knowledge of potato diseases. The literature cited embraces 37 papers.—*W. Stuart.*

PHARMACEUTICAL BOTANY AND PHARMACOGNOSY

Heber W. Youngken, *Editor*
E. N. Gathercoal, *Assistant Editor*

(See also in this issue Entries 2125, 2153, 2168, 2211, 2264, 2265, 2281, 2290, 2302, 2454, 2461, 2463, 2486, 2488, 2496, 2499, 2546, 2674, 2720, 2978, 3138)

2918. Anonymous. **Poison ivy.** Missouri Bot. Gard. Bull. **12:** 87–91. *Pl. 23–24.* 1924.—The author discusses ivy poisoning and other types of dermatitis. He outlines the treatment for ivy poisoning.—*O. T. Wilson.*

2919. Anonymous. **Poisoning caused by eating daffodil bulbs.** Missouri Bot. Gard. Bull. **12:** 52. 1924.—The author discusses a case of "narcissine" poisoning in Scotland.—*O. T. Wilson.*

2920. Anonymous. **Some valuable members of the mint family.** Missouri Bot. Gard. Bull. 12: 99–103. 1924.—The author discusses the economic uses of various members of the *Labiatæ*.—*O. T. Wilson.*

2921. Arnold, H. L. **Poisoning from castor beans.** Science 59: 577. 1924.—The author reports cases of illness and death from ingestion of castor beans.—*C. J. Lyon.*

2922. Director of the Imperial Institute. **Essential oil of Stirlingia latifolia from western Australia.** Bull. Imp. Inst. 21: 318–320. 1923.—A sample of the oil of this small Proteaceous shrub tested at the Imperial Institute was found to consist almost entirely of acetophenone. This drug has marked soporific properties and is employed medicinally under the name of "hypnone." Hitherto, it has been supplied from synthetic preparations, the only previously recorded natural occurrence being in gum labdanum. Aside from its use in medicine it has been employed in perfuming soaps. The oil from *Stirlingia* may find a market if it can compete with the synthesized product, but since the yield is low, it seems hardly likely that it will do so.—*L. A. Kenoyer.*

2923. Director of the Imperial Institute. **The medicinal value of Oncoba oils.** Bull. Imp. Inst. 21: 585–587. 1923.—In 1908, seed of *Oncoba echinata* from Sierra Leone were found to contain 46% of hard white crystalline fat; 87.5% of the fatty acid forming this fat was found to be chaulmoogric acid, an acid which is obtained in India from the seed of *Taraktogenos* and *Hydnocarpus*, and which has proved valuable as a cure for leprosy. Seed of *Oncoba spinosa* also from Sierra Leone, were recently analyzed. While they contain much oil, it is free from chaulmoogric acid. It is a drying oil which might be used in making paints and varnishes.—*L. A. Kenoyer.*

2924. Herbert, D. A. **Stinging crystals in plants.** Science 60: 204–205. 1924.—Investigations of tissues of the Cabo Negro palm (*Arenga pinnata* Merr.) and the pungapung (*Amorphophallus campanulatus* Blume) have disclosed the reasons for the stinging effect of crystals of calcium oxalate in plant tissues. The action is the result of 2 stages, the mechanical action of the cystals in piercing the skin and the entry of a proteolytic enzyme which is the chief irritant. Both stages of the action are overcome by boiling the tissues, thus allowing such parts to be used for food.—*C. J. Lyon.*

2925. Judd, C. S. **The leper's tree.** Amer. Forests and Forest Life 30: 275–277. *3 fig.* 1924.—The author describes the properties of chaulmoogra oil for the treatment of leprosy, isolation of the active principle, and the promising plantations of different kinds of chaulmoogra trees (*Hydnocarpus*) started in Hawaii.—*Chas. H. Otis.*

2926. Lutz, L. **Formation de gomme adrangante par l'Astragalus aristatus L'Her., dans la region briançonnaise.** [**Tragacanth gum formation by A. aristatus in the Briançon region.**] Bull. Soc. Bot. France 69: 480–481. 1922.—The author did not see commercial quantities of this gum formed there but reports a new locality for its occurrence.—*P. A. Young.*

2927. Lutz, L. **Nouvelles observations sur les Astragales à gomme adrangante.** [**New observations on the tragacanth gum of Astragalus.**] Bull. Soc. Bot. France 69: 79–80. 1922.—The author reports this gum formation in *Acanthyllis numidica* Pomel.—*P. A. Young.*

2928. Turrill, W. B. **Solenostemma argel in the Sahara.** Kew Bull. 1923: 239. 1923.—*Solenostemma argel* Hayne, a drug plant of the family *Asclepiadaceæ*, was recently collected in Northern Air, central Sahara, a western extension of the previously known range of this species. The medicinal properties are given, as well as those of "agar" leaves from an unidentified tree also found in Air.—*T. J. Fitzpatrick.*

2929. Wise, L. E. **Alcohol via the wood route.** Amer. Forests and Forest Life 30: 370–372. *2 fig.* 1924.

2930. Wise, L. E. **Trees as oil producers.** Amer. Forests and Forest Life 30: 301–304. *6 fig.* 1924.—This article treats of some of the oils obtained from trees, which are used in commerce and medicine.—*Chas. H. Otis.*

PHYSIOLOGY

B. M. Duggar, *Editor*

W. J. Robbins, *Assistant Editor*

(See also in this issue Entries 2117, 2131, 2133, 2155, 2156, 2183, 2211, 2213, 2228, 2231, 2284, 2288, 2298, 2305, 2308, 2322, 2340, 2346, 2385, 2597, 2607, 2698, 2706, 2733, 2792, 2793, 2794, 2795, 2835, 2845, 2847, 2855, 2859, 2887, 2907, 2927, 3127)

GENERAL

2931. Meyerhof, Otto. **Chemical dynamics of life phaenomena.** *110 p.* J. B. Lippincott Co.: Philadelphia & London, 1924.—This work encompasses the following phenomena: (a) The physicochemical mechanism of cell respiration; (b) autoxidations in the cell; (c) chemical relations between respiration and fermentation; (d) the transformation of energy in muscle; (e) the energetics of cell processes.—So much of fundamental importance is included in the discussions that the attention of the plant physiologist is necessarily directed to the work.—*B. M. Duggar.*

2932. Montemartini, Luigi. **Su l'azione specifica di alcuni eccitanti sopra le foglie.** [The specific action of certain irritants on the leaves.] Atti. Ist. Bot. Univ. Pavia Ser. III 1^2: 1–12. 1924.—The author studies the action of copper sulphate, strychnine, and ethyl alcohol on the respiration, photosynthesis, transpiration, and translocation of minerals in leaves of *Glycine* and other plants. Dilute solutions of $CuSO_4$ accelerate photosynthesis and translocation, increase the amount of Ca in the leaves during the day and decrease it during the night, and decrease transpiration. Strychnine decreases photosynthesis but increases respiration and transpiration, increases the sensibility of the plant to light, and favors the formation of compounds of P and K, opposing the formation of those of Ca. Ethyl alcohol (1%) decreases respiration but increases photosynthesis, transpiration, and the accumulation of Ca, P, and K, but stops their translocation at night.—*P. D. Caldis.*

PROTOPLASM, MOTILITY

2933. Andrews, F. M. **Chloroplasts of Martynia frag[r]ans.** Proc. Indiana Acad. Sci. Meeting 38: 267–268. *Fig. 1.* 1922 [1923].—The arrangement and rate of movement of the chloroplasts in the trichomes on the stem are discussed. The terminal cell of a uniseriate trichome bears the chloroplasts. Under optimal light conditions the chloroplasts move 21μ in 7 minutes. "It required from 37 to 43 minutes under fairly constant optimal light and temperature conditions for the chloroplasts to traverse the cell."—*Edwin J. Kohl.*

2934. Crozier, W. J., and H. Federighi. **Critical thermal increment for the movement of Oscillatoria.** Jour. Gen. Phys. **7**: 137–150. *Fig. 1–6.* 1924.—In a species of Oscillatoria exhibiting movement of type suitable for exact measurement, the velocity of linear translatory motion is found to be controlled by the temperature (6–36°C.) in accordance with Arrhenius' equation for irreversible reactions. The value of the critical increment (u) is 9,240. The extreme variates in series of measurements at different temperatures yield the same value of u. The velocity of movement is therefore regarded as determined by the velocity of an underlying chemical process, controlled by the temperature and by the amount of a substance (? catalyst) whose effective quantity at any moment varies within definite limits in different filaments of the alga.—On the basis of its temperature characteristic, the locomotion of *Oscillatoria* is compared with certain other processes for which this constant is calculated.—*O. L. Inman.*

2935. Lepeschkin, W. **The constancy of the living substance.** [**Experiments made on Spirogyra.**] Studies Plant Physiol. Lab. Charles Univ. Prague. **1**: 5–44. *1 pl.* 1923.—Using 4 unidentified species of *Spirogyra*, the author studied the stability or "constancy" of living substance with reference to the influence of temperature, mechanical pressure, light, hydrogen-ions, hydroxyl-ions, ethyl alcohol, lipoid-soluble substances, and glycerin. In the effect of high temperature 4 (or 5?) phases are distinguishable. The time necessary for a certain phase varies with the different species of *Spirogyra* as well as with the different cells of the same thread. On the average, the temperature coefficient for heat coagulation was found

to be 1.4. The effects of high temperature expressed in the 1st 2 phases, may be annulled by the synthetic processes of the cell by which the denatured proteins are reconstructed. When heating is prolonged to the 3rd phase, coagulation results, the synthetical processes do not suffice, and the cell dies. Denaturation of cell proteins produces death by bringing about the decomposition of the protein-lipoid substances. Such decomposition may be effected also by mechanical means which, like heat, act especially on the superficial strata of protoplasm. Mechanical effects operating with high temperature, therefore, reduce the coagulation-time of the living substance. The constancy of living substance is decreased by light, hydrogen-ions, ethyl alcohol, and by narcotics in relatively high concentrations, owing to the accelerating effect of these agents on the denaturation of proteins. Hydroxyl-ions in very small concentration, narcotics in weak concentrations acting for a short time, and glycerin in weak concentration were found to increase constancy. In weak concentrations, narcotics of high dialectric constant and little capacity to absorb proteins, increase constancy even when operating for weeks.—*Charles Drechsler.*

2936. Prát, Silvestr. **Vliv centrifugování na Hydrodictyon reticulatum (L.) Lag. [The effect of centrifugal force upon the cell of Hydrodictyon.]** Studies Plant Physiol. Lab. Charles Univ. Prague 1: 89-96. *4 fig.* 1923.—Portions of water-net were subjected to centrifugal force from 500 to 600 times greater than gravity, and there was observed the effects of the displacement of the protoplasm thus brought about. No displacement was achieved either in the old long yellow cells or in the youngest green cells. However, the contents of long (1–1.5 cm.) green cells were readily displaced as a dense dark-green mass at one end, never to become redistributed, but either forming zoospores or degenerating. In yellowish cells (3–5 mm. long) the entire contents were crowded toward the outer end which, 2–4 days later, became distended, giving the cell a paddle-like form. Such abnormal form was retained after redistribution of contents was effected. The author concludes that a polynuclear cell does not behave as a physiological, united whole, a unilateral amassing of cytoplasm and nuclei causing a local limited growth of the cell membrane.—*Charles Drechsler.*

2937. Prell, Heinrich. **Zur Theorie der sekretorischen Ortsbewegnung. I. Die Bewegung der Cyanophyceen. [The theory of secretory locomotion. I. The motion of the Cyanophyceae.]** Arch. Protistenk. 42: 99–157. *11 fig.* 1921.—The Cyanophyceae accomplish locomotion by the secretion of jelly or slime through the pores in the membrane. This is formed in equal amount by all cells of the filament. As in the desmids, the gelatinous coat of the Cyanophyceae consists of single threads which swell up soon after formation and adhere to one another forming a continuous coat. Locomotion along the longitudinal axis is brought about by the pressure of the swelling of these threads. Rotation is dependent on the arrangement of the pores in 2 crossing spiral systems. Oscillatory motion is independent of locomotion, and is due to the secretion of the gelatin. Reversal of the direction of motion may be brought about by a momentary general cessation of the gelatin secretion. The forward movement then ceases. The swelling continues at the basal part of the slime threads, and they are shifted in the direction of least resistance, backwards. When secretion is renewed the filament moves backward in the gelatinous coat. Strong stimuli may cause contraction, which will also bring about a reversal in the direction of motion. Responses to stimuli are limited to quantitative changes in gelatin secretion and contraction of the filament, and are not true taxies (tropisms). There does not seem to be any conduction of stimuli within the filament.—*Harold Kirby.*

2938. Prell, Heinrich. **Zur Theorie der sekretorischen Ortsbewegung. II. Die Bewegung der Gregarinen. [The theory of secretory locomotion. II. The motion of gregarines.]** Arch. Protistenk. 42: 157–175. 1921.—There are 2 sorts of movement in gregarines—peristaltic movements due to the contraction of the protoplast or myonemes, and gliding movements without changes of form. A review is given of the previous investigations relative to the movements of gregarines. The author finds that locomotion is accomplished by the secretion of slime through pores in the furrows of the epicyte. The gelatinous threads thus formed, primarily perpendicular to the body surface, are secondarily shifted and bring about a movement in the direction of the long axis. Changes in the direction of motion are brought about by active or passive changes in the form of the protoplast.—*Harold Kirby.*

2939. Scarth, G. W. **Adhesion of protoplasm to cell wall and the agents which cause it.**

Trans. Roy. Soc. Canada Ser. 3, 17: 137–143. 1923.—"Types of abnormal plasmolysis are described in which the protoplasm remains partially or completely in contact with the cell wall. This behaviour is shown to be due simply to adhesion between protoplasm and cell wall, and not necessarily to increased permeability of the protoplasmic membrane or to stiffening of the protoplasm. On the alkaline side of a point between pH 4 and pH 5, cations are active in producing this adhesion in proportion to their general activity in precipitating negative colloids. They are inactive on the acid side of this point. The only anions active in the ordinary pH range are dichromates and chromates. Washing in water reverses the effect. It is completely antagonized by methylene blue even in very weak solution. Hypotheses as to the cause of adhesion are discussed."—*Author's summary.*

DIFFUSION, PERMEABILITY, PHYSIOCHEMICAL PHENOMENA

2940. Hoagland, D. R., A. R. Davis, and J. C. Martin. **The composition of the cell sap of the plant in relation to the absorption of ions.** Jour. Gen. Phys. 5: 629–646. *Fig. 1.* 1923.—Chemical examination of the cell sap of *Nitella* showed that the concentrations of all the principal inorganic elements, K, SO_4, Ca, Mg, PO_4, Cl, and Na, were very much higher than in the water in which the plants were growing. Conductivity measurements showed that almost all inorganic elements must exist in the cell in ionic form. The pH of normal cells was 5.2 and the NO_3-ion penetrated into the cell sap much more easily in a slightly acid than in an alkaline solution. Buffer effects upon the acidity of cell sap, exosmosis of Cl as a criterion of injury, and the effect of ammonium salts on the pH of cell sap were studied.—*O. L. Inman.*

2941. Iljin, W. S. **Die Permeabilität des Plasmas für Salze und die Anatonose.** [**Permeability of protoplasm to salts and anatonosis.**] Studies Plant Physiol. Lab. Charles Univ. Prague 1: 97–119. 1923.—The author attacks the problem of permeability by studying the phenomenon of deplasmolysis—that is, the recovery after a variable period of a normally turgid condition in cells plasmolyzed by exposure to salt solutions, without the tissues concerned being removed from the solution. A variety of plants—including *Rumex acetosa, R. confertus, R. maritimus, Cirsium canum, Ranunculus repens, Beta vulgaris, Pisum sativum, Ficaria ranunculoides, Erysimum strictum, Aster tripolium,* and many others—were used in these experiments. Slices of epidermis were exposed to various concentrations of agents like NaCl, $BeCl_2$, LiCl, $CaCl_2$, KCl, RbCl, $SrCl_2$, $BaCl_2$, glycerin, saccharose, maltose, and lactose, and the condition relative to plasmolysis, recovery from plasmolysis, turgidity as expressed by the degree to which the stomata were found open, and the correlated conservation or disappearance of starch grains, were observed at appropriate intervals. The conclusion is reached that recovery from plasmolysis is not brought about primarily by the entrance of the plasmolyzing agent into the protoplast, but by the induced production within the cell of a substance increasing osmotic pressure, this, in the cases studied, being sugar derived from the hydrolysis of starch grains. Such hydrolysis was found to begin soon after immersion in the solutions, being induced evidently as a result of the adsorption by the protoplasm of a very small quantity of the salt in question, rather than by general infiltration of the salt into the cell in quantity great enough to bring about directly any considerable deplasmolysis.—*Charles Drechsler.*

2942. Lloyd, Francis E. **Some effects of narcotics on Spirogyra.** Anesthesia and Analgesia 3: 9–19. *1 pl.* 1924.—"(1) Low, non-lethal concentrations of the narcotics studied [alcohol, ether, chloroform], when their effect is fully reversible, when followed by salt solutions which may be hypertonic, produce an increased imbibition capacity of the cell colloids. Lethal doses work in the opposite direction.—(2) The character and amount of this change in imbibition capacity may be such as to permit the cell to become turgid even in hypertonic salt solution at least as high as 0.6 N in the case of KNO_3. A result of narcosis is increased capacity of the taking up of water, due, it may be, to increased permeability to salts which then cause swelling of the colloids of the cell.—If, as appears to be the case, the failure to plasmolyse is due to increased permeability to salts, it must be noted that this condition is reversible (3) A difficulty in accepting this view of the matter however, lies in the behavior of the plant in medium concentrations of ether (2 and 1%) in

which the filaments become tightly curled. This I have attributed to increased turgidity of the cells, attendant on decreased permeability, though the behavior is open to other interpretation in terms of imbibition. Nevertheless, such cells showed the swelling on the application of salt.—(4) Chloroform and ether tend to produce adhesion of the cytoplasm to the walls, the former more than the latter in my own observations."—*Frederick V. Rand.*

2943. McCutcheon, Morton, and Baldwin Lucke. **The mechanism of vital staining with basic dyes.** Jour. Gen. Phys. 6: 501–507. 1924.—The authors' conclusions are as follows: (1) Solutions containing NH_4OH and NaOH, and CO_2 and HCl may be used to produce various combinations of extracellular and intracellular reactions in starfish eggs, *Gonionemus*, and *Nitella* cells. (2) Staining by basic dyes is, with a constant intracellular reaction, favored by increased extracellular alkalinity. With a constant extracellular reaction, staining is hindered by increased intracellular alkalinity. (3) These facts are in opposition to the view that staining of cells by basic dyes is chiefly governed by a combination of the dyes with cell proteins. It is more in harmony with the view that the combination is with a substance or substances of acid nature.—*O. L. Inman.*

2944. Montemartini, Luigi. **Sopra la forza osmotica delle radici e la partecipazione delle cellule vive del legno al fenomeno della salita dell' acqua nelle piante. [The Osmotic pressure of the roots and the participation of the living cells of the wood in the ascent of water in plants.]** Atti Ist. Bot. Univ. Pavia Ser. III. 1²: 35–45. *Pl. 1–2.* 1924.—Experiments were conducted to determine whether a diminution in the living aerial organs of the plant reflects itself on the extremity of the roots, reducing the osmotic force of the absorbing cells. This was arrived at 1st by determining the residual humidity (wilting coefficient) of a soil where 2 sets of plants were grown under identical conditions except that 1 set had a part of the leaves removed; and 2nd by determining the concentration of a slightly hypertonic solution which produced wilting in plants with different numbers of leaves, but otherwise similar. The plant having all its leaves intact wilted first in the 1st case and removed more water from the soil before wilting, indicating that the absorbing force of the roots was greater than in the plant with the reduced leaf surface. In the 2nd case the plant whose leaves were partly removed wilted first and could stand a smaller concentration of salts, indicating that the roots of the plant with the entire leaf surface have a greater osmotic force. It was also observed that the action of variations in leaf surface on the osmotic force is transmitted rather slowly through the stem. On account of the greater transpiration, smaller plants could stand a higher concentration of salts than older plants.—*P. D. Caldis.*

2945. Pringsheim, E. G. **Über Plasmolyse durch Schwermetallsalze. [Plasmolysis induced by salts of the heavy metals.]** Beih. Bot. Centralbl. Abt. I. 41: 1–14. 1924.—*Leptobryum piriforme, Mnium cuspidatum, Hypnum, Spirogyra setiformis, Begonia manicata, Vallisneria spiralis, Camellia Rhoeo discolor, Vriesea, Allium cepa, Elodea canadense,* and *E. densa* were used in the experiments. These show that solutions of $ZnSO_4$, $MgSO_4$, $NiSO_4$, $CaSO_4$, $CuSO_4$ and $FeSO_4$, as well as aluminium salts produce plasmolysis in plant cells. With suitable plants it is possible to determine the necessary concentration. If not left in the hypertonic solution too long, deplasmolysis may be secured by adding water.—*L. Pace.*

2946. Shull, C. A. **Imbibition in relation to absorption and transportation of water in plants.** Ecology 5: 230–240. 1924.—This paper reviews recent work by MacDougal, Gortner, and others, on the relation of colloidal hydration to growth, to the origin of succulence and xeromorphy, and to hardiness. There is a detailed discussion of the "problems of the development of saturation deficit in leaf colloids, the energetics of transfer, and the absorptive functions of roots." The magnitude of the molecular force with which water passes into an average dry air rises as high as 1250 atmospheres. Very large imbibitional forces may then be developed within the plant, even when considerable water is present. If the relative humidity is 93%, organic matter in moisture equilibrium with this humidity develops an atmospheric force of 100 atmospheres in the internal colloidal water. Holle reports imbibitional forces as high as 368 atmospheres in fern annuli. Drying then does not have to go far to develop sufficient imbibitional force to exert a pull equal to the height of the water column and the total resistance. Imbibitional and osmotic forces tend to march toward equilibrium in all

parts of the plant. The beginning of the absorption of water by the roots must be the imbibition of water by the root-hair wall "which has developed a saturation deficit through the propagation backward to it of the leaf deficit."—*H. C. Hanson.*

WATER RELATIONS, TRANSLOCATION

2947. Dixon, H. H. **Transport of organic substances in plants.** (Presidential address) Rept. British Assoc. Adv. Sci. 1922: 193–203. 1923.—The author briefly discusses the literature dealing with the movement of organic substances in plants, and presents some results of his own experiments. His conclusions, based on his own work and that of other workers, may be stated as follows: The transport of organic substances needed in the distal growing regions is effected through the vessels of the wood. It is not admitted, on physical considerations, that the phloem affords sufficiently rapid transport for the upward and downward movement of organic substances. Both water and dissolved organic substances may move downward as well as upward in the wood. In explanation of the function of the phloem, the writer calls attention to the large exposure of surface which the phloem and living elements of the wood present to the wood tissues. This large surface may find explanation in the necessity of exchange between the living cells and dead conduits.—*C. L. Wilson.*

2948. Dixon, Henry H. **The transpiration stream.** *74 p. 2 fig.* Univ. London Press: London, 1924.—The book is a series of 3 lectures given at the Univ. of London. The 1st chapter deals with the mechanism of the movement of water in the lifeless elements of plants. The author refers to recent publications showing that water columns are continuous in stems of herbaceous plants, and not broken by air bubbles as claimed by some investigators. References are also made to investigations on the tension of cell sap with air dissolved in it, several investigators having found the tension to be over 300 atmospheres, or more than necessary to secure the cohesion required of the sap in the vessels. Experiments of Renner and Nordhausen, attempting to determine the actual tension developed in transpiring branches, are mentioned. The writer is satisfied that his tension theory has been much strengthened by recent publications.—Chapter 2 deals with the function of the living elements in lifting the water current. The experiments of Bose and his theory of the ascent of sap are discussed at some length. Attempts to duplicate the results of Bose are mentioned. The author thinks that the explanation offered by Bose is most unsatisfactory. Ursprung and Blum have carried on experiments attempting to show that living cells in the stem neutralize the resistance of the wood by their osmotic pressure, however, the writer states "I cannot see how it will support Ursprung's contention that living cells remove the 'dead' resistance of the wood." The writer is of the opinion that living cells seem to be necessary in the leaves but not in the stem.—The 3rd chapter takes up the role of the transpiration current in the transport of substances throughout the plant. In this chapter the author endeavors by experiments and calculations to show that the organic substances (foods) as well as the mineral substances are transported by the transpiration stream in the ducts. He points out that under special conditions at least, there is a backward flow in a stem and this may readily carry the organic substances from the leaves to the lower parts of the plant. The function of the bast, medullary rays, and wood parenchyma is to introduce the organic materials into the ducts, also to keep the latter from plugging up with foreign materials. Their function then becomes one of attendants upon the ducts.—*F. G. Gustafson.*

2949. Gertz, Otto. **Laboratorietekniska och mikrokemiska notiser. 7. Om vattenhalten hos stärkelse.** [**Laboratory—technic and microchemical notes. 7. The water content of starch.**] Bot. Notiser **1922**: 69-76. 1922.—Potato-starch contains a good deal of water, up to 40–50°. Dry "potato-flour" of commerce contains 19.22–19.88°. The method used for testing the amount of water, was to heat the starch in a liquid which does not absorb water, as paraffin-oil, molten paraffin or stearin. Glycerin may also be used after previous boiling, to free it from water. In the case of potato starch heated to about 120°C. in paraffin oil, the water bubbles began to form at 105°C. At 140°C., the starch began to color brownish, showing that the starch itself had begun to decompose. Several well known tests for water vapor were applied. The author leaves it undecided whether the water vapor produced originated wholly from merely mechanically held water, or otherwise. When treated with stearin or

paraffin, especially, the starch formed itself into amorphic lumps. A part of the free water might have been united chemically with the starch, and a small amount of starch-paste might have been formed. The swollen, deformed grains gave, however, a typical blue reaction with iodine and water, which showed that dextrination had not taken place. If paraffin-oil free from water is heated with iodine in a test tube, and a layer of dry starch is attached in the tube some distance above the liquid, the starch becomes light brown; but if starch is also placed in the liquid, the starch in the upper part of the tube becomes intensely blue, showing that water vapor is driven out of the immersed starch, and condenses in the upper part of the test-tube. There is a German résumé.—*P. A. Rydberg.*

2950. Hilts, R. W. **Report on the determination of moisture in dried fruit.** Jour. Assoc. Official Agric. Chem. 8: 130–132. 1924.

2951. Ursprung, A. **Über das Eindringen von Wasser und anderen Flüssigkeiten in Interzellularen.** [The entrance of water and other fluids into intercellular spaces.] Beih. Bot. Centralbl. Abt. I. 41: 15–40. 1924.—These questions are discussed: (1) The possibility of wetting intercellular areas; (2) cause of the difficulty of wetting them (a gas layer, the presence of fats, waxes, etc., the chemical nature of the wall layer); (3) the significance of surface tension for wetting; (4) the rise of fluids in intercellular spaces; (5) the removal of air from preparations; (6) the physical basis of infiltration methods; (7) the significance of the peculiar ridges on the walls of the guard cells.—*L. Pace.*

2952. Weevers, Th. **Ringing experiments with variegated branches.** K. Akad. van Wetenschappen Amsterdam. Proc. Sect. Sci. 26: 755–762. 1923.—In order to determine whether the upward transfer of foods during periods of terminal shoot growth takes place through the xylem or the phloem tissues, the author conducts ringing experiments making use of variegated branches of *Aesculus Hippocastanum* and *Acer Negundo*. The use of branches bearing leaves with no chlorophyll eliminates the possible manufacture of food above a ring, as would occur in normal green leaves, and thus does not necessitate defoliation or darkening of this part. Ring wounds were protected by wet bandages or by the application of cocoa butter. Experiments were carried out in the spring just before the buds started growth and also in midsummer. The experiments consisted of complete ringing of normal green and of yellow shoots and partial ringing of yellow shoots. In either spring or midsummer experiments, complete ringing of yellow shoots prevented normal growth while partial ringing of yellow shoots or complete ringing of normal green shoots allowed considerable growth. Analyses of *Aesculus* showed 3% of reducing sugar in the green leaves, 1% in the yellow leaves from unringed branches and only traces in those from ringed branches. When ringed, the leaves from the yellow branches often showed early withering and death. Though no variegated branches were available, comparable experiments were performed with *Nerium Oleander* which bears phloem strands internal to the secondary xylem. Ringed branches darkened by enclosure in black paper continued growth, indicating that the ringing had not in this case prevented food movement. The bearing of these experiments upon the interpretations of Th. Hartig and Hanstein and on the hypotheses of Dixon and of Curtis with regard to food transfer is discussed.—*Otis F. Curtis.*

MINERAL NUTRIENTS, SALT RELATIONS

2953. Brink, R. A. **The influence of electrolytes on pollen tube development.** Jour. Gen. Phys. 6: 677–682. *Fig. 1.* 1924. (For abstract see this issue, Entry 2555.)

2954. Gericke, W. F. **The beneficial effect to wheat growth due to depletion of available phosphorus in the culture media.** Science 60: 297–298. 1924.—Phosphorus is actually harmful if present in available form for the last ¾ of the period of growth. The author works in water cultures and suggests that productive soils have a provision for withdrawal of available phosphorus after the time of early growth. The mechanics of the soil that makes this possible centers about the low concentration of water-soluble phosphorus present and its low rate of solution. This peculiar fact about nutritive requirements of wheat as a typical crop plant, suggests a reasonable explanation for the failure of many fertilizer experiments and promises to lead to a new basis for fertilizer application.—*C. J. Lyon.*

2955. Olaru, D. A. **Actiunea manganezului asupra vegetalelor inferioare si în special asupra microbilor. [The influence of manganese on lower plants, especially "microbes".]** Viaţa Agric. [Bucureşti] 13: 231–237. 1922.—Upon microorganisms which play an important role in the fertility of the soil, a favorable influence of manganese was shown.—*Al. Borza.*

2956. Успенский, Е. Е. [Uspenski, E. E.] **Марганец в растении. [Manganese in plants.]** Журнал Московского Отделения Русского Общества [Jour. Moscow Sect. Russian Bot. Soc.] 1: 65–95. 1922.—The paper deals with the penetration and action of feeble bases. Accumulation of Mn in plants is affected by the aeration of the culture, but is uninfluenced by transpiration. Slight acidity of the medium (0.0001 N HCl) retards, slight alkalinity (0.0001 N K_2CO_3) augments absorbtion of Mn. The root hair-zone, because of its slight acidity, shows little accumulation of Mn even in a slightly alkaline medium. Compared to the roots of the pea, the root hairs and root tips of Sarrasin accumulate Mn with much greater difficulty. The medium must have an alkalinity of 0.005 N K_2CO_3 before Mn is stored. By the use of the less soluble Mn_3O_4, the injury of the roots is prevented even though a greater amount of Mn may finally be taken up by the roots. A large number of lower organisms were also studied and it was found that many of them tolerated a high concentration of Mn in the culture medium; these plants, however, absorbed Mn very slowly and thus adjusted themselves. Algae, for example, *Cladophora*, developed greatly thickened walls, such as are found in cyst formations.—*Ernst Artschwager.*

PHOTOSYNTHESIS

2957. Baly, E. C. C. **Photosynthesis.** (Abstract) Rept. British Assoc. Adv. Sci. 1922: 395–396. 1923.—(See also Bot. Absts. 12, Entry 1428.)

2958. Blackman, F. F. **The biochemical problems of chloroplastic photosynthesis.** (Abstract) Rept. British Assoc. Adv. Sci. 1922: 395. 1923.

2959. Briggs, G. E. **The efficiency of the photosynthetic mechanism of green plants for different wave-lengths of incident radiation.** (Abstract) Rept. British. Assoc. Adv. Sci. 1922: 396. 1923.

2960. Eve, F. C. **Photosynthesis from the energy aspect.** (Abstract) Rept. British. Assoc. Adv. Sci. 1922: 396. 1923.

2961. Potter, M. C. **Photosynthesis: electric energy.** (Abstract) Rept. British Assoc. Adv. Sci. 1922: 396. 1923.

2962. Spoehr, H. A. [Rev. of: Bose, Jagadis Chunder. **The physiology of photosynthesis.** *xx + 287 p. 60 illus.* Longmans, Green & Co.: London, New York, 1924.] Science 60: 408–409. 1924.

2963. Spoehr, H. A., and J. M. McGee. **Absorption of carbon dioxide the first step in photosynthesis.** Science 59: 513–514. 1924.—The rate of absorption of CO_2 by the leaf during photosynthesis has been shown to be faster than the laws of diffusion and gas solubility can account for. Dried and ground leaf materials absorb much gas. The extraction of dried leaves with water or cold absolute alcohol reduced the absorptive capacity somewhat, but extraction with a saturated aqueous solution of ether reduced it 90%. The proteins were removed by the latter treatment and it is here suggested that they absorb most of the CO_2 on the basis of the carbamino reaction.—*C. J. Lyon.*

METABOLISM (GENERAL)

2964. Clements, F. E., Frances Long, and J. V. G. Loftfield. **Translocation and storage in autumn.** Carnegie Inst. Washington Year Book 22: 307. 1924.—Attention was directed to stomatal activity, starch in the guard-cells and mesophyll, and starch in stem, root, and rhizome. With snow or cold nights starch was depleted in the leaves of exposed plants and it appeared again only after several days of clear weather.—*B. E. Livingston.*

2965. Colin, H. **La migration de l'inuline dans les plantes greffées. Greffes Topinambour sur Soleil annuel, Soleil vivace sur Soleil annuel. Analyse des bourrelets. [Migration of inulin in grafted plants. Helianthus tuberosus and H. multiflorus on H. annuus. Analysis of the swellings.]** Bull. Soc. Bot. France 69: 2–5. 1922.—It is easy to graft one species of *Helianthus* on another. *H. annuus* does not contain inulin. Its enzymes convert inulin diffusing into it from grafts.—*P. A. Young.*

2966. Combes, Raoul. **A propos de publications récentes sur la formation des pigments anthocyaniques.** [Recent publications on the formation of anthocyanin pigments.] Bull. Soc. Bot. France 70: 222–232, 263–276. 1923.—The author gives an extensive account of the formation of anthocyanin and presents several structural formulae.—*P. A. Young.*

2967. Denny, F. E. **Hastening the coloration of lemons.** Jour. Agric. Res. 27: 757–769. *2 fig.* 1924.—Some commercially mature lemons are green in color when picked. The desired yellow color must be secured by subsequent treatment. In ordinary storage under suitable conditions, green lemons will turn yellow in 30–60 days. When forced coloring is desirable, the change from green to yellow can be brought about in 6–10 days by the use of the combustion gases that arise from stoves that are burning kerosene. The object of the investigation was to determine the identity of the gaseous constituent responsible for the coloration of the fruit. It was found that ethylene in low concentrations could bring about this color change. When mixed with air in varying proportions by volume, concentrations of ethylene of 1 to 200,000 colored lemons in 5–8 days. A concentration of 1 to 2,000,000 required 6–10 days. The lowest concentration tried (1 to 5,000,000) required about 14 days, indicating that this concentration represents the highest dilution at which the rate of coloring is markedly influenced. High concentrations appear to retard coloring, since 80% ethylene for 7 days gave only slight coloring. Absence of oxygen prevented coloration of the fruit by ethylene. Coloration was not measurably hastened by ethylene at a temperature of 45° F., but the rate of coloring increased with increasing temperatures from 57–82°F. A reduction in rate, however, was observed at 93°F. Both ethylene and stove gas increased the rate of respiration of lemons. The CO_2 output was increased about 150–250%. The effect upon green lemons of many other substances, including carbon monoxide, acetylene, methyl chloride, formaldehyde, acetaldehyde, pyridine, amyl acetate, and chlorine, was tested.—*Author.*

2968. Eyster, W. H., and M. M. Ellis. **Growth of maize seedlings as affected by glucokinin and insulin.** Jour. Gen. Phys. 6: 653–670. 1924.—Solutions of glucokinin and insulin increased the growth of roots and tops of young maize seedlings. Strong solutions decreased growth. The greater gain in weight due to treatment with insulin seemed to be the result of increased photosynthetic activity.—*O. L. Inman.*

2969. Heilbron, I. M., and C. Hollis. **Some speculations on the phyto-synthesis of plant products.** (Abstract) Rept. British. Assoc. Adv. Sci. 1922: 396. 1923.

2970. Hurd, Annie May. **The course of acidity changes during the growth period of wheat with special reference to stem-rust resistance.** Jour. Agric. Res. 27: 725–735. *Fig. 1–5.* 1924.—The titratable acidity of the juice of the wheat plant undergoes a regular sequence of changes during development from the seedling stage to maturity. There is a progressive decrease, sometimes to half the initial concentration, between the ages of 2 and about 6 weeks. This period is followed by a period of relatively low acidity, with minor fluctuations, extending up to the visible approach of maturity, at which time the acid concentration rises as the plants ripen and dry. The final value may be twice the highest seedling concentration and almost 3 times that of the least acid stage. The H-ion concentration does not decrease appreciably between the ages of 2 and 6 weeks. It is greatly increased during the preripening period and reaches a relatively high value at the flowering stage and later. Both the titratable-acid and H-ion concentrations are influenced by environmental conditions which determine the rate of growth and which bring about daily fluctuations in acidity, but these variations are insignificant in comparison with the changes correlated with the changing stage of development of the plant, so that the major trends in the acidity curves persist clearly under all conditions. Stunted, slow-growing plants, such as those of Kanred in a warm greenhouse, are characterized by an extremely high titratable-acid content and H-ion concentration and may not have the intermediate period of low acidity. Also, infection by mildew, when severe enough to visibly affect the vigor of the plant, results in an abnormally high acidity.—Relatively high acidity of the juice does not hinder attacks of the stem-rust organism, for investigators have found that the wheat plant is as susceptible during the heading and flowering stages as it is during the earlier periods of low acidity. Conversely, low acidity does not predispose to the disease, since the plant is no more liable to infection during the period of lowest acidity than it is during

the earlier and later stages. Moreover, resistant varieties pass through the period of low acid concentration at the same stage as do the susceptible ones and no breakdown in their resistance at this time has been reported.—*Author.*

2971. Levene, P. A., and B. J. C. Van der Hoeven. **On concentration of vitamin B.** Science 59: 276. 1924.—This short note announces the successful concentration of vitamin B from yeast by precipitation with $Ba(OH)_2$.—*C. J. Lyon.*

2972. Mascré, Marcel. **Les cellules à anthocyane des pétales d'Anagallis. [Anthocyanin cells in the petals of Anagallis.]** Bull. Soc. Bot. France 70: 888–895. *Fig. 1–3.* 1923.—The author made a microchemical study of the pigments in the different parts of the flowers of *Anagallis arvensis* L. and *A. caerulea* Lamk. The locations of the various pigments are figured. —*P. A. Young.*

2973. Miller, Edwin C. **Daily variation of the carbohydrates in the leaves of corn and the sorghums.** Jour. Agric. Res. 27: 785–808. *Fig. 1–6.* 1924.—In order to determine the changes of the carbohydrates in the leaves of corn and the sorghums during the day, analyses were made of material collected at 2-hour intervals from the leaves of the Pride of Saline corn, Dwarf Yellow milo, and Red Amber sorgo grown under identical or similar field conditions during the summers of 1916, 1917, and 1919. The results were expressed in terms of the number of grams of constituents per unit of leaf area. (1) The total sugars in the leaves of the plants under observation began to increase between 4 and 6 A.M., and reached a maximum which varied from 12 noon to 5 P.M., and decreased gradually from that time until daylight the following morning. In the 10 observations the maximum amount of sugar in the leaves occurred in 5 cases at the same time as the maximum amount of dry matter, while in the other 5 cases the maximum sugar content was reached at periods varying from 1 to 6 hours earlier than the maximum amount of dry matter. There is no evidence to show that there is any difference between corn and the sorghums in regard to the time of day at which the maximum amount of sugar and dry matter may occur in the leaves. (2) The insoluble carbohydrates were estimated as starch according to the official method of acid hydrolysis; they thus include also the pentosans and other insoluble carbohydrates that are converted into reducing sugars by boiling with HCl. The insoluble carbohydrates thus estimated generally reached a maximum later in the day than the sugars, and after reaching a maximum showed little decrease until about midnight, then decreasing rapidly until daylight. The total increase in the dry matter of the leaves during the day could not be accounted for by the increase in the sugars and insoluble carbohydrates during the same period. The increase in the total sugars and insoluble carbohydrates in the leaves during the day only approximated from 46 to 92% of the total increase in the dry matter of the leaves for the same period. (3) The nonreducing sugars in the leaves of the plants studied were, with the exception of the Dwarf milo and Red Amber sorgo, always in excess of the reducing sugars. The nonreducing sugars increased markedly during the day and decreased during the night, while the reducing sugars, as a rule, showed very little increase, and the amount present at the different periods of the day was very irregular. The maximum increase in the reducing sugars in the leaves during the day in the case of corn and milo only amounted to 1/10–1/3 the increase in the nonreducing sugars. No significant differences were observed between corn and the sorghums in regard to the relationship between reducing and nonreducing sugars in the leaves.—*Author.*

2974. Mills, J. E. **Alkaline reaction of the cotton plant.** Science 60: 268. 1924.—The under side of the leaf, the tender buds and the stems were found to give off a substance that showed an alkaline reaction with phenol-phthalein. Leaves from other species failed to give the reaction except in the case of the related species, okra. It is suggested that the compound may attract the bool weevil.—*C. J. Lyon.*

2975. Morison, C. B. **The production of hydrogen sulphide by yeast.** Science 60: 482–483. 1924.—Yeast is known to produce H_2S in the presence of certain S compounds, but it is not credited with its production in dough. Some wheat flour of otherwise normal quality has been found to give off the gas on fermentation. It is possible that the gas demonstrated is due to contamination of the flour from fumigating residues in the warehouse.—*C. J. Lyon.*

2976. Moser, Stewart A. **Citrate utilization by members of the colon-aerogenes group and their differential characteristics.** Jour. Bact. 9: 59. 1924.—*Bacillus coli* of fecal

origin can be distinguished from soil organisms through inability of fecal bacteria to multiply in media containing a citrate as the sole source of carbon, whereas soil bacteria grow luxuriantly in the same media. At least 23 strains of soil organisms would be considered positive fecal coli according to results of the methyl red test, but may be proved of non-fecal origin through their ability to grow and multiply in media containing 2 gm. of sodium citrate per l. as the only source of carbon. The presence of these strains in soil and their absence from fecal specimens would indicate that many times the methyl red confirmation has been responsible for reporting the presence of fecal bacteria when soil bacteria only were present. The ability to utilize citrates should prove a valuable method of identifying more accurately the fecal as compared with the non-fecal bacteria.—*Linn H. Enslow.* (*Public Health Engineering Abstracts.*)

2977. Naumann, Einar. **Untersuchungen über die Eisenorganismen Schwedess I. Die Erscheinungen der Sideroplastie in den Gewässern des Teichgebiets Aneboda. [Sideroplasty in the waters of the lake region of Aneboda.]** Kungl. Svenska Vetensk. Handl. 62⁴: 1–68. *Pl. 1–6, fig. 1–35.* 1921.—The writer investigated extensively the phenomenon of sideroplasty in the lake region of Aneboda in Sweden. The yellow iron deposits are all of biologic origin and largely due to the activities of organisms belonging to the Schizomycetes, Myxophyceae, Flagellatae, Chlorophyceae, and Conjugatae. There are no stationary ocre deposits which would be the result of strictly local activities of long duration, the intensity of the deposition shifting from year to year and occupying different regions. Hand in hand with the precipitation of iron (siderogony), dissolution of iron compounds (siderophagy) takes place. The phenomena of sideroplasty and siderophagy in general are insufficiently investigated. About the formation of actual swamp iron ores and the phenomenon of siderophagy or dissolution of iron compounds, we know next to nothing.—*Ernst Artschwager.*

2978. Shibata, Keita, Shojira Iwata, and Makoto Nakamura. **A new flavone glucuronic acid compound from the roots of Scutellaria baicolensis. (Biochemical studies on flavone derivatives. I.)** (Japanese.)—Bot. Mag. Tokyo 36: (1)–(17). *6 fig.* 1922.—A new flavone derivative of the type indicated was found in this crude drug of old Chinese medical use. The new compound is called "baicalin" ($C_{21}H_{18}O_{11}$) and the flavone body is designated "baicalein." The constitution of the last named is given as 1, 2, 3 trioxy flavone, a compound recently synthetically produced by Barghellini. Besides, the root contains an ether-soluble constituent "wogonin" ($C_{17}H_{14}O_5$) which is tentatively regarded as dimethyloxybaicalein. It is shown microchemically that the cell sap of cortex and wood parenchyma of the fresh root is rich in a baicalin salt, which suggests a reserve storage product.—*Author.* (*Courtesy Japanese Jour. Bot.*)

2979. Stark, Robert W. **Environmental factors affecting the protein and the oil content of soy beans and the iodine number of soy bean oil.** Jour. Amer. Soc. Agron. 16: 636–645. 1924.—Applications of lime, organic matter, and rock phosphate increased the percentage of protein and decreased the oil content. Potash applied in addition to phosphate, lime, and residues decreased the protein content and increased that of oil. Production of oil was increased by applications of organic matter and limestone while P and K had little effect. The iodine number of the oil varied in the different varieties of soy beans; no consistent relation was found to exist between iodine number and location or soil treatment.—*F. M. Schertz.*

2980. Wichmann, H. J. **Report on pectin in fruits and fruit products.** Jour. Assoc. Official Agric. Chem. 8: 123–130. 1924.

METABOLISM (NITROGEN RELATIONS)

2981. Cohn, Edwin J., Ruth E. L. Berggren, and Jessie L. Hendry. **Studies in the physical chemistry of the proteins. IV. The relation between the composition of zein and its acid and basic properties.** Jour. Gen. Phys. 7: 81–98. 1924.—The minimal molecular weight of zein was estimated by determining the tryptophane content of casein and the figure given is 20,000. Zein, a protein with very low concentration of diamino acid, has no apparent basic properties. The fact that zein has a very small concentration of both acid and basic groups, and that it is but slightly soluble in water, acids, and alkalies, makes it a very inert protein.—*O. L. Inman.*

2982. Farnell, R. G. W. **The effect of cold and of hot liming on the removal of albumin from cane juices.** Internat. Sugar Jour. 26: 359–363. 1924.—The paper deals with albumin and other nitrogenous substances of an ampholytic nature. The distribution of nitrogen in cane juices is shown in tabular form; the properties of albumin and isolectric points of the ampholytes in cane juice are discussed; a brief description of the experimental procedure in determining nitrogen, hydrogen-ion concentration, and Brix, and in the cold-liming and hot-liming tests is given. With the latter there is a table showing results of these tests, and a discussion of the results.—*Nellie E. Fealy.*

2983. Power, Frederick B., and Victor K. Chesnut. **Alkaline reaction of the cotton plant.** Science 60: 405. 1924.—J. E. Mills has recently referred (Science 60: 268. 1924.) to observations made by C. M. Smith on this subject. From studies of the chemistry of the cotton plant it is here reported that the alkalinity is due to emanations of ammonia and trimethylamine.—*C. J. Lyon.*

2984. Prianichnikov. **Sur l'assimilation de l'ammoniaque par les plantes supérieures. [Assimilation of ammonia by higher plants.]** Rev. Gén. Bot. 36: 5–11. 1924.—The author concludes that probably the plant, etiolated or green, always reacts in the same way toward ammonia. It absorbs it with avidity transforming it immediately into combinations of organic nitrogen with a greater rapidity than occurs in the case of the nitrates, since the latter must undergo a reduction into ammonia with the power to give rise to amides, acid amines, or bodies of double function of the structure $R(NH_2)\ CONH_2$, such as asparagin or glutamin. It is the ammonia that is at the same time the last term of the oxidation of nitrogenous materials and the 1st material used in the synthesis of these substances, combining with organic acids which result from the oxidation of carbohydrates.—The parallelism between the energy of nitrification and the development of plants is caused by factors of a secondary nature. Anything which prevents nitrification, as the acid reaction of the soil, or insufficient aeration, prevents at the same time the development of the higher plants.—*J. C. Gilman.*

METABOLISM (ENZYMES, FERMENTATION)

2985. Бреславец, Л. П. [Breslavets, L. P.] **О пероксидазе в пестролистных растениях. [On peroxidase in plants with variegated leaves.]** Журнал Московского Отделения Русского Общества [Jour. Moscow. Sect. Russian Bot. Soc.] 1: 96–99. 1922.—The quantity of peroxidase in the white part of variegated leaves is much greater than in the green parts. Hybrids between variegated and green races of *Tropaeolum majus* contain an amount of peroxidase which constitutes the mean of the amount found in the parent races.—*Ernst Artschwager.*

2986. Bridel, Marc. **Application du procéde biochimique de caractérisation du glucose à la recherche de la maltase dans le malt. [Application of the biochemical method of recognizing glucose to the search for maltase in malt.]** Bull. Soc. Chim. Biol. 6: 705–712. 1924.—The enzyme preparation obtained by precipitating an aqueous extract of malt with alcohol contains sucrase, as it slowly converts saccharose into reducing sugars. The amount is entirely too small to account for the rapid increase in reducing sugars occurring in aqueous suspensions of malt. The rate of conversion was followed by adding emulsin in methyl alcohol, removing and determining the methyl glucoside formed, and adding new emulsin. Glucose was formed at a rate more than double the rate of hydrolysis of added saccharose. Maltose added to an aqueous malt extract was vigorously attacked with formation of reducing sugar; hence maltase was present.—*Joseph S. Caldwell.*

2987. Harvey, R. B. **Enzymes of thermal algae.** Science 60: 481–482. 1924.—Tests made with an alga (*Phormidium laminosum*) from a hot spring at the temperature 65–73°C., showed that it possessed no catalase and little oxidase but it gave a strong peroxidase and probably an oxydo-reductase action. This is the first demonstration of absence of catalase from an organism. The absence of certain enzymes used in metabolic processes may be balanced by the action of high temperature on the reaction, according to the Van't Hoff coefficient. If this is possible it helps to explain the origin of life.—*C. J. Lyon.*

2988. Herissey, H., et R. Sibassié. **Recherches biochemiques sur la nature et la quantite des principes hydrolysables par l'invertine et par l'emulsine, contenus dans quelques**

graines de Legumineuses. [Biochemical studies of the nature and amount of substances hydrolyzable by invertase and by emulsin present in certain leguminous seeds.] Bull. Soc. Chim. Biol. 6: 759–769. 1924.—Finely ground dry seed were extracted under a reflux condenser with 60% alcohol, and the alcohol was evaporated off under reduced pressure. The extract was dissolved in water and subjected to the action of invertase and emulsin. The amount of reducing sugar initially present was in all cases small, 0.4% or less. The seed of *Medicago sativa*, *Trigonella Foenum-graecum*, and *Indigofera tinctoria*, contain stachyose; and those of *Anthyllis vulneraria* and *Hedysarum coronarium* contain raffinose, the latter to the amount of 1% by weight of the decorticated seed. The 1st 3 contain stachyose to the exclusion of other sugars; it does not appear to be present in those containing raffinose. Glucosides were present in the seed of *Cytisus scoparius* and *Copaifera officinalis;* the glucoside of the latter yields coumarin on hydrolysis. Seed of 13 horticultural varieties of *Phaseolus vulgaris*, 6 varieties of *Pisum sativum*, and 4 varieties of *Ervum lens* were subjected to treatment with invertase; the initial and final amounts of reducing sugars are presented in tabular form but the nature of the sugars found was not ascertained. (See also Bot. Absts. 14, Entry 805.)—*Joseph S. Caldwell.*

2989. Hugounenq, L., et J. Loiseleur. **Recherches expérimentales sur l'action catalytique de certains colloides, et particulierement du glycogéne, comparée aux phénomènes diastasiques. [Experimental studies of the catalytic action of certain colloids, and especially glycogen, compared with enzymic phenomena.]** Bull. Soc. Chim. Biol. 6: 791–811. 1924.—The hypothesis that enzymes may be active by virtue of purely physical properties of the colloidal state (efficiency as a carrier for H- or OH-ions) was tested by determination of the effects of a wide variety of colloids upon freshly coagulated and finely divided egg albumen. The results obtained with glycogen are reported in detail. There was no activity on the part of any of the colloidal catalyzers in the absence of H- and OH-ions, that is, in pure water. In the presence of HCl there was consistent but small increase in the hydrolysis of egg albumen when colloidal iron or lecithin was added. In the presence of NaOH, there was consistent and slightly larger increase of hydrolysis when glycogen was added. In the absence of acid or alkali, as when the glycogen was repeatedly purified, there was no increase in hydrolysis. The ash obtained by incinerating a given weight of ordinary commercial glycogen had greater activity than that amount of glycogen. The amount of action upon albumins of varying origin is unequal but is always very small. It is independent, in considerable degree, of the nature of the base dissociated, but is proportional to the ionic concentration. The effects produced by the action of enzymes are of a wholly different order of magnitude, and the results here obtained do not bear out the theory that enzymes produce their effect in purely physical fashion, by reason of the surface they present for transfer of ions.—*Joseph S. Caldwell.*

2990. Kořinek, J. **De l'influence de Bacterium fluorescens et B. pyocyaneum sur le Mycobacterium de Friedmann. [The influence of Bacterium fluorescens and Bact. pyocyaneum on the Mycobacterium of Friedmann.]** Studies Plant Physiol. Lab. Charles Univ. Prague 1: 80–88. 1923.—The author concludes that the lipases of *Bacterium fluorescens* are not capable of hydrolyzing the lipoids of *Mycobacterium tuberculosis poikilothermorum* in any manner capable of demonstration by staining methods. *Bact. fluorescens* was found not to produce anything analogous to the pyocyonase with bacteriolytic properties, the only effect that could be attributed to it being of the nature of autolysis, this occurring only in liquid media. In perfectly neutral media, the products of autolysis have a slightly alkaline reaction. The appearance of granules within the bacterium is regarded as the first evidence of autolysis. The granules revealed after staining by the Ziehl-Neelsen method are not identical with those revealed in preparations of *Mycobacterium* stained according to Gram.—*Bacterium pyocyaneum* digests mycobacteria, although apparently in liquid media such digestion is associated with autolysis.—*Charles Drechsler.*

2991. Lavialle, Pierre. **Sur le rôle digestif de l'épiderme interne du tégument ovulaire des Composées. [The digestive role of the inner epidermis of the ovulary integument of the Compositae.]** Bull. Soc. Bot. France 69: 75–79. 1922.—The author tries to show by microchemical experiments that this layer secretes enzymes and has digestive functions.—*P. A. Young.*

2992. Sørensen, S. P. L. **Science's bakery invasion.** Baking Technology 3: 289–320. 1924.—The H-ion concentration of dough affects the quality of the bread by (1) affecting the activity of the enzymes of the flour, and (2) by determining the physico-chemical condition of the substances in the flour, especially the proteins. A pH of 5.0 represents the optimum H-ion concentration for the activity of a number of enzymes, among them diastase. The proper activity of diastase is necessary for the breaking down of the starch in the dough, to maltose. Maltose is split further by the yeast into glucose, and this sugar, in the process of alcoholic fermentation, is broken down into alcohol and the desired CO_2. Hydrogen-ion concentration is a very important factor also in the physico-chemical condition of gluten and in the coagulation and transformation of the proteins in the dough in baking. Denaturation proceeds the more rapidly the higher the H-ion concentration, but precipitation of the denatured protein takes place only at or near its isoelectric reaction.—*A. M. Hurd-Karrer.*

ORGANISM AS A WHOLE.

2993. Barotte, J., et H. Velu. **Essais d'isolement en culture du crypotocoque de la lymphangite épizootique du cheval, par l'emploi de milieux à l'acide citrique.** [**Trial isolations in culture of the Cryptococcus of epizoötic lymphangitis of the horse, by the use of media containing citric acid.**] Bull. Soc. Path. Exotique 17: 540–543. 1924.—This Cryptococcus retained its vitality but made little growth in 47 days, both on Sabouraud's gelatin + 5% citric acid and in peptone water + 5% citric acid. Pure cultures of the Cryptococcus were transferred from tubes sown with this organism and Staphylococcus, and from tubes sown with pus, after 47 days incubation in these media. The acid gelatin merely inhibited growth of *Staphylococcus;* the acid peptone water killed it in this interval.—*Philip Brierley.*

2994. Berthelot, Albert, et E. Ossart. **Influence des milieux biliés sur la composition chimique du Bacillus subtilis.** [**Influence of a medium containing bile on the chemical composition of Bacillus subtilis.**] Bull. Soc. Chim. Biol. 6: 770–772. 1924.—Cultures upon a gelose medium with addition of beef bile contain 20.75% of material soluble in absolute alcohol and 2.42% of material hydrolyzable by H_2SO_4 to reducing sugars as compared with 17.16% alcohol-soluble material and 8.69% hydrolyzable to reducing sugars by H_2SO_4 in cultures grown on bile-free gelose medium.—*Joseph S. Caldwell.*

2995. Hinchliff, Mildred, and J. H. Priestley. **Further notes upon the vascular plants characteristic of peat.** Naturalist 1924: 201–209. *Pl. 13.* 1924.—In continuation of earlier work, experiments were carried out to determine the influence of the Ca content of culture solutions on the growth of peat plants. The development of seedlings of *Calluna* in washed sand moistened with culture solutions containing variable proportions of $Ca(NO_3)_2$ led to the conclusion that the lower proportions were more favorable, agreeing with results obtained earlier by M. C. Rayner. The parallel effect of discoloration and stunted growth attending the absence of mycorhiza was discussed; photomicrographs showed an accumulation of fat at the base of the meristem of abortive secondary roots, suggesting that under normal conditions growth was facilitated by removal of excess fatty acids by the mycorhizal fungus.—Ripe seed of *Calluna vulgaris, Empetrum nigrum* and *Vaccinium macrocarpum* yielded 42, 10 and 22%, respectively, of fats having high iodine values (132–143), which on exposure dried to a firm elastic skin. The relation of fats in seed to the development of seedling tissues was discussed: the high percentage of fat of high iodine value in linseed did not lead to the deposition of fats and secondary endodermis in seedlings of *Linum usitatissimum.*—*W. H. Burrell.*

2996. Maneval, W. E. **Longevity of cultures of Fusaria.** Phytopathology 14: 408–410. 1924.—During the spring of 1916 test tube cultures of 10 species of *Fusarium* were placed in an ice chest and held for the duration of the experiment at a temperature near 10°C. During March, 1924, transfers were made to tubes of potato-dextrose agar. Growth was obtained from *Fusarium conglutinans, F. niveum, F. oxysporum, F. vasinfectum, F. discolor, F. gibbosum, F. Solani,* and *F. trichothecoides.* No growth was obtained from *F. coeruleum* or *F. discolor* var. *sulphureum.*—*B. B. Higgins.*

2997. Priestley, J. H., and J. Ewing. **Etiolation.** (Abstract) Rept. British Assoc. Adv. Sci. 1922: 402. 1923.

2998. Whitworth, Stanley Howarth. **The influence of hydrogen ion concentration on the biology of the anthrax organism.** Diss. 130 p. H. Roth: Zurich, 1924.

GROWTH, DEVELOPMENT, REPRODUCTION

2999. Anonymous. **Mechanism of cell growth.** Nature 114: 258–259. 1924.—This article discusses the work of several investigators, and especially a recent paper by Friedl Weber.—*O. A. Stevens.*

3000. Исаченко, Б. Л. и А. А. Егорова. [Isachenko, B. L. and A. A. Egorova.] **Наблюдения над ростом плодового тела шляпных грибов.** [Observations on the development of fructifications of pileate fungi.] French résumé. Известия главного ботанического сада P. C. ф. C. P. [Bull. Princip. Jard. Bot. République Russe] 21: 109–113. 1924.—From their observations on the rapidity of growth of *Boletus rufus* the authors conclude that: (1) The stipe grows rather uniformly, giving an average increase of 1.6 cm. per day (24 hours). (2) The average increase per 24 hours in the pileus is 1.62 cm., but growth during the various periods of development differs from that of the stalk in a greater fluctuation. (3) The maximum rate of growth in the stalk lies at the 3rd or 4th day, after which the decrease in rapidity is marked. (4) Increase in the diameter of the pileus occurs within the period of growth acceleration during the first 5 or 6 days: the maximum is noted at the 4th or 5th day, after which the growth rate decreases. (5) The life of the fruiting body averages 8–10 days. More limited observations on *Boletus scaber* and *Amanita muscaria* showed similar growth relations.—*Frederick V. Rand.*

3001. Pearsall, W. H., and J. H. Priestly. **Leaf growth.** (Abstract) Rept. British Assoc. Adv. Sci. 1922: 394. 1923.

MOVEMENTS OF GROWTH AND TURGOR CHANGES

3002. Prankerd, T. L., and F. M. O. Waight. **On the presentation time and latent time for reaction to gravity in pteridophytes.** (Abstract) Rept. British Assoc. Adv. Sci. 1922: 397. 1923.

3003. R., A. D. **Theories of growth and senescence.** [Rev. of: Robertson, T. Brailsford. **The chemical basis of growth and senescence.** (Monographs on experimental biology) *viii* + *389 p.* J. B. Lippincott Co.; Philadelphia and London, 1923.] Nature 114: 267–270. 1924.

3004. Withycombe, C. L. **On the function of the bladders in Utricularia vulgaris L.** Jour. Linn. Soc. Bot. London 46: 401–413. *11 fig.* 1924.—The bladders of *Utricularia* are not to be regarded as passive traps, but they show movement in response to stimulus, as was briefly noted by the author in 1916. Brocher first observed this fact in 1911 and Merl described the phenomenon in greater detail in 1922. As a bladder becomes sensitive its lateral walls bulge inwards. On touching certain hairs upon the valve or lid closing the orifice of the bladder this valve is released and an influx of water occurs as the walls of the bladder return to their non-sensitive position. The mechanism of the bladder is discussed in detail. A note on the post-embryonal development of *Utricularia* is appended. In this the author differs from previous observers and states that the early stages closely resemble those of *Pinguicula*. On page 413, owing to a misprint, the statement is made that the "stomata" are thrown off the leaf. This should read that the "water" is thrown off the leaf.—*Author.*

GERMINATION, RENEWAL OF ACTIVITY

3005. Brink, R. A. **The physiology of pollen. I. The requirements for growth.** Amer. Jour. Bot. 11: 218–228. 1924.—This is a review of previous work on certain aspects of pollen physiology, including pollen tube growth in general, the chemical composition of pollen and conducting tissue, food storage and utilization, enzyme relations, experiments on artifical pollen culture, and the carbon and oxygen requirements for pollen tube growth. The author states the source of the pollen used in his own experiments and his methods of cultivating pollen and studying tube-growth.—*E. W. Sinnott.*

3006. Brink, R. A. **The physiology of pollen. II. Further considerations regarding the requirements for growth.** Amer. Jour. Bot. 11: 283–294. 1924.—Sterile yeast was found to have a stimulating effect on the growth in length of pollen tubes in sugar solutions. Boiling or autoclaving at 120° caused little reduction in this growth-stimulating power. Small amounts of raw fruit juices, notably from crushed stigmas, ovarian tissue or raw potato, gave

similar stimulation. The amount of bursting in pollen germinated artificially is apparently related to the osmotic concentration of the surrounding medium, although this has much less effect upon germination and growth. The cell membrane of the grain and tube seems to be permeable to cane sugar. The addition of salts to pollen cultures usually hinders or inhibits growth, although yeast ash does not do so. A specially prepared product, "Bactoagar," gave much lower germination and smaller growth than did the ordinary shred agar; and a similar result was obtained with chemically pure sucrose as compared with commercial cane sugar. The mineral impurities present in shred agar and commercial sugar may be responsible, through their antagonistic action, for the greater growth in these media. No satisfactory evidence was obtained as to the effect of differences in pH on pollen tube growth.—*E. W. Sinnott.*

3007. Nakajima, Yôzô. [**Length of life of the seed of the genus Salix.** (Japanese.)] Bot. Mag. Tôkyô 35: (17)–(42). 1921.—The author has investigated experimentally the influence of humidity and temperature upon the length of life of seed of *Salix opaca*, *S. japonica*, and *S. Reinii*. It is well known that the seed of different species of *Salix* maintain their capacity for germination for only a brief period of time. The author preserved seed of the above named species in closed glass tubes, employing in each tube, for the purpose of maintaining different humidities, such reagents as $CaCl_2$, H_2SO_4, NaCl, glycerin, KOH, KNO_3, and $CaCO_3$. Germination was tested from time to time. It was determined that vitality was best preserved in tubes containing equal volumes of H_2SO_4 and water, or in those containing $2\frac{1}{2}$ parts $CaCl_2$ and 1 part water (excellent germination after 10 weeks). In tubes with pure H_2SO_4 or $CaCl_2$ good germination could not be secured after 1 week. He has also shown that those seed at a medium temperature above 25°C. are strongly inhibited, so that those held below 25°, and in moderately dry air (as in the solution of H_2SO_4 mentioned above), are best preserved. A number of seed collected from early May until early October were placed in tubes of $2\frac{1}{2}$ parts KCl and 1 part water, then arranged in running spring water at 12–13°. After 150 days the number capable of germinating was 60%, and even after 320 days a few seed germinated.—*Author.* (*Courtesy Japanese Jour. Bot.*)

3008. Toole, Eben Henry. **The transformations and course of development of germinating maize.** Amer. Jour. Bot. 11: 325–350. *4 fig.* 1924.—After a review of the literature on the physiology of seed germination, the author describes in detail the structure of the dry and the germinating grain. Chemical changes during germination, as observed by microchemical and by quantitative methods, are described and the influence of various environmental factors discussed. The results emphasize the close interralation that exists between the various internal processes concerned in germination, and the sharp localization of the chemical transformations which may be associated with such processes. Reducing sugar appears in the coleorhiza as it elongates and is finally found in all growing parts except embryonic tissue. Non-reducing sugar is present in all parts of the embryo during all stages. There is usually a correlation between the enlargement of cells and their sugar content. The decrease in the amount of fat contained in the embryo is slow and gradual. Soluble proteins move from the endosperm to the active tissues of the embryo. Reducing sugar appears in the endosperm at about the same time as in the embryo. Depletion of endosperm reserves begins next to the scutellum, but at the end of 7 days only a small part of the endosperm reserves have been used. There seems to be a correlation between activity of the epithelial layer and growth changes in other parts of the seed. The early germination of embryos deprived of their endosperm shows the same changes as in the intact grain, but later development is modified by the nature of the food supply. Evidence from microchemical and quantitative methods is in complete agreement. Various external factors may modify normal development.—*E. W. Sinnott.*

REGENERATION

3009. Loeb, Jacques. **Regeneration from a physico-chemical viewpoint.** *143 p. 115 illus.* McGraw-Hill Book Co.: New York, 1924.—In his introduction the author says: "It will be shown in the book that the only 3 assumptions necessary to explain the phenomenon of regeneration in *Bryophyllum calycinum* are, 1st, that under the influence of light the chlorophyll in the leaves or stems causes directly or indirectly the formation of those soluble substances

which are required for growth, such as sugars, amino-acids, and other specific and non-specific substances which may be needed. The special nature of these substances does not concern us here beyond assuming that the leaf or the stem is able to produce all the substances required for the growth of new shoots or roots. The 2nd assumption is that the mass of material, formed by the influence of light on chlorophyll, increases (under equal conditions of illumination, temperature, moisture, and solutes or gases in the environment) in proportion to the mass of chlorophyll. These 2 assumptions will not be seriously questioned. The 3rd assumption is that the mass of chlorophyll of the leaf or stem used for regeneration remains fairly constant during the limited time the experiment lasts."—Under Part I, "Mutilation and regeneration," the following main topics are discussed: (1) General remarks about the material and the experiments; (2) Regeneration and mass relation in isolated leaves of *Bryophyllum;* (3) The inhibiting action of the rapidly growing notches on the other notches of a leaf: (4) The influence of gravity on the formation of roots and shoots in a detached leaf of *Bryophyllum;* (5) Why does separation of a leaf from the plant induce the growth of roots and shoots in a leaf? (6) The validity of the mass relation for regeneration in a defoliated piece of stem of *Bryophyllum calycinum;* (7) The role of the inhibiting effect of rapidly growing parts in the regeneration of the stem.—Part II, "Polarity in regeneration," takes up the subject under the following main headings: (8) The influence of the leaf on the regeneration in the stem; (9–10) The influence of gravity on the polar character of regeneration in a stem of *Bryophyllum;* (11) The inhibitory action of apical leaves on the formation of shoots in the lower part of the stem; (12) Callus formation; (13) Inhibitory effects of a second order by an apical leaf; (14) The inhibitory effect of an apical leaf on shoot formation in a stem suspended horizontally; (15) The growth of the axillary shoots; (16) Some preliminary experiments on the path of the ascending and descending sap in the stem of *Bryophyllum;* and (17) The formation of flowers in *Bryophyllum.*—*Frederick V. Rand.*

3010. Loeb, Jacques. **Theory of regeneration based on mass relation. III. Further experiments on the cause of the polar character of regeneration.** Jour. Gen. Phys. 6: 463–477. *Fig. 1–8.* 1924.—The author working with *Bryophyllum* concludes that, (1) Small stems with 1 large leaf in the middle produce shoots and roots chiefly at the expense of material sent into the stem by the leaf. Since the sap of the leaf can cause the formation of roots and shoots in the same notch of the leaf, it is difficult to assume that the polar character of the regeneration in the stem is due to a chemical difference in the ascending and descending sap sent by the leaf into the stem. (2) When the ascending sap sent by a leaf into the stem is caused with the aid of gravity to reach those tissues of the stem from which roots are formed, an abundant root formation is produced by the ascending sap. (3) These 2 observations in connection with a fact already published in a preceding paper support the idea that the polar character of regeneration in a stem of *Bryophyllum* is not due to any of the chemical differences between the ascending and descending sap but to a difference in the nature of the tissues or 'anlagen' which are primarily reached by the ascending and descending sap."—*O. L. Inman.*

TEMPERATURE RELATIONS

3011. Anonymous. **Frost flowers.** Missouri Bot. Gard. Bull. 12: 104–105. *Pl. 31–32.* 1924.—This phenomenon, caused by the freezing, under certain conditions, of water which is being gradually forced from plant tissues, is described and illustrated.—*O. T. Wilson.*

3012. Hamil, J. M. **Notes on the pasteurization of milk.** Great Britain Min. Health. Repts., Pub. Health and Med. Subs. 17. *1–14.* 1923.—The effect of pasteurization upon bacterial content is a phase of the problem discussed.—*B. M. Duggar.*

3013. Hecht, Selig. **Intensity discrimination and the stationary state.** Jour. Gen. Phys. 6: 355–373. *Fig. 1–6.* 1924.—"(1) A method of experimentation is described which enables one to record objectively and quantitatively the discrimination by *Mya* between 2 intensities of illumination to which it is successively exposed. The indicator for this discrimination is a response at a given reaction time.—(2) From the data so obtained it is found that the difference, ΔI, between the 2 intensities bears no constant relation to the initial intensity, I. Instead, the ratio $\Delta I : I$ varies in a consistent manner with I. As the latter increases, the ratio decreases to a certain point, after which it increases.—(3) The data are

analyzed in terms of the photochemical mechanism previously proposed for the sensitivity of *Mya* to light. It is shown that for the animal to discriminate by means of a given reaction between one intensity and another, the transition from one to the other must be accompanied by the decomposition of a constant amount of photosensitive substance in the sense organ.—(4) A mathematical treatment of the behavior of the photochemical mechanism shows not only that the ratio $\Delta I : I$ cannot be constant as required by the Weber-Fechner law, but that it must vary in the way in which it does. The behavior of *Mya* under these conditions, therefore, supports the validity of the hypothetical physicochemical mechanism suggested for its sensitivity."—*Author's summary.*

RADIANT ENERGY RELATIONS

3014. Anonymous. **Making plants work overtime by means of electric light.** Sci. Amer. 130: 91. *1 fig.* 1924.—This is a popular report of a six-weeks' test by the Westinghouse Lamp Company in cooperation with Peter Henderson & Company, seedsmen, of the value of electric light for accelerating plant growth. The lights were switched on every night at 8 p.m. and shut off automatically at 1 a.m., thus allowing for a rest period. Many of the plants exposed to electric lights grew to approximately twice the size of similar plants receiving daylight. In some cases, however, there was no perceptible gain in growth, particularly in the root crops, including beets, carrots and radishes.—*Chas. H. Otis.*

3015. Adams, J. **The effect on tomato, soy bean, and other plants of altering the daily period of light.** Amer. Jour. Bot. 11: 229–232. 1924.—By periodical darkening, several species of plants during their growing period (about 6 weeks in May and June) were exposed to light for a shorter daily period than the natural day, about 12 hours as compared with 15. With tomatoes, the darkened and the undarkened plants came into flower at about the same time; with soy beans, the former flowered a little earlier than the latter. In the hemp nettle the undarkened plants flowered earlier but were somewhat shorter than the darkened ones. In shamrocks, darkening delayed the average date of flowering by about 11 days.—*E. W. Sinnott.*

3016. Langworthy, C. F. **Radioactivity of ripe tomatoes.** Science 60: 405–406. 1924.—The pronounced radioactivity was found to be more than 3 times as great as that of city water.—*C. J. Lyon.*

3017. Pascher, A. [Rev. of Nienburg, W. **Die Polarisation der Fucus-Eier durch das Licht.** (Polarization of Fucus eggs by light.) Wiss. Meeresuntersuch. N. F. Abtlg. Helgoland 15: Festschr. f. Heinke 46?:(?).] Arch. Protisten. 46: 386. 1923.

TOXIC AGENTS

3018. Reynolds, Ernest S. **Some relations of Fusarium lini and potassium cyanide.** Amer. Jour. Bot. 11: 215–217. 1924. *Fusarium lini* was grown on agar in which potassium cyanide was present in varying strengths, from 0.001 M to 0.1 M. Measurements of the colonies were made at 46, 77, 125 and 151 hours, and the diameter of a colony was used as a measure of its growth. The fungus was able to grow in concentrations up to 0.02 M, but total growth was found to be depressed by the KCN, the amount of this depression being roughly proportional to the concentration of KCN. The rate of growth of the KCN cultures, however, although slower in the earlier periods, was actually higher in the later periods than was that of the control cultures. This suggests a stimulating effect of KCN after the early injurious effect has been overcome.—*E. W. Sinnott.*

MISCELLANEOUS

3019. Pratt, Gilbert H. **Latest developments in chlorine control apparatus for sterilization of water supplies.** Jour. New Eng. Water Works Assoc. 38: 63–72. 1924.

3020. Reeve, Lewis. **A new method of micro-gas analysis.** Jour. Chem. Soc. [London] 125: 1946–1954. *4 fig.* 1924.—A detailed description is given of an apparatus for the quantitative estimation of CO_2, CO, H_2 and formaldehyde, in 0.05 cc. or less of a gas mixture, with error of about 0.5% by volume. A suggestion regarding the use of the apparatus for O_2 and for hydrocarbon gases, such as methane, is made. A capillary tube with approximately 0.8 mm.

bore is used, 1 mm. length of tube representing 0.000547 cc. Directions are given for adjusting the mercury column to atmospheric pressure and for properly applying the absorbing reagents. —*F. E. Denny.*

3021. Tuck, Davis H. **A new form of portable illuminometer.** Jour. Optical Soc. Amer. and Rev. Sci. Instruments 9: 259–301. 1924.

TAXONOMY OF VASCULAR PLANTS

J. M. Greenman, *Editor*

E. B. Payson, *Assistant Editor*

(See also in this issue Entries 2128, 2131, 2265, 2272, 2276, 2281, 2287, 2291, 2298, 2302, 2353, 2374, 2402, 2404, 2405, 2406, 2407, 2408, 2411, 2415, 2418, 2419, 2483, 2489, 2510, 2513, 2550, 2704, 2718, 2926, 3023, 3024)

GENERAL

3022. Anonymous. **Additions to the Index Kewensis.** Kew Bull. 1923: 120–128. 1923.—This is a condensed list of new names proposed by E. H. L. Krause in the 2nd edition of Sturm's Flora von Deutschland, 1900–1906. The full list, about 750 names, will appear in the 6th supplement of the Index Kewensis. Many of the new combinations are due to the adoption by Krause of a wide generic concept. For instance, he includes all genera of Cruciferae under the generic name *Crucifera; Lycium, Atropa, Physalis,* and *Nicander* are aggregated into the genus *Boberella; Aster* includes *Conyza, Bellis, Stenactis,* and *Erigeron; Chamaemelum* includes *Chrysanthemum, Achillea, Anthemis, Cotula, Tanacetum, Matricaria, Cladanthus, Gymnocline,* and *Anacyclus.* The limits of many other genera are changed. He uses the specific name *hybridus* for hybrids and *dubius* for doubtful plants generally, of a genus.—*T. J. Fitzpatrick.*

3023. Anonymous. **Citations of generic names in the Index Kewensis.** Kew Bull. 1923: 239–240. 1923.—A note is given on change of starting-point for the nomenclature of genera from 1735 to 1753, thus making many references prior to 1753 invalid. In such cases Dalla Torre et Harms, *Genera Siphonogamarum* (1900–1907) may be consulted.—*T. J. Fitzpatrick.*

3024. Anonymous. **Index Kewensis.** Kew Bull. 1923: 95–96. 1923.—Directions are given for the proper recording of proposed new species or new combinations.—*T. J. Fitzpatrick.*

3025. Anonymous. [Rev. of: Ridley, Henry N. **The flora of the Malaya Peninsula. Vol. II. Gamopetalae.** *vi + 672 p.* 1923; vol. III. Apetalae. *vi + 406 p.* L. Reeve & Co.: London, 1924 (see Bot. Absts. 12, Entry 6655; 13, Entry 8067).] Nature 114: 84. 1924.—The reviewer regrets a number of imperfections such as too brief descriptions of new species and lack of citations to specimens.—*O. A. Stevens.*

3026. Andrews, Luman. **Catalogue of the flowering plants and ferns of Springfield, Massachusetts, growing without cultivation.** Bull. Mus Nat. Hist. [Springfield, Mass.] 3. *1–221. 10 pl.* 1924.—This catalogue is based primarily on the collections and manuscript prepared by the late Luman Andrews, although its publication has been the work of a Committee of the Springfield Botanical Socity, including C. A. Weatherby. The catalogue records the occurrence of 37 species and varieties of ferns and fern-allies, and 991 species, varieties, and hybrids of seed plants. Scientific and common names are given for each species; and record is made of frequency or rarity, habitat, distribution, and pertinent notes. The nomenclature followed is that of Gray's Manual, 7th edition.—*J. M. Greenman.*

3027. Clute, Willard N. **American plant names.** *Small 8vo 215 p.* Willard N. Clute & Co.: Joliet, Illinois, 1923.—The author aims to present a list of all vernacular names of the plants of northeastern America. The volume is divided into 2 parts. Part 1 gives the Latin name, followed by one or more common names. Part 2 is an alphabetical index of all plant names included in the work.—*J. M. Greenman.*

3028. Hall, Harvey M. [Rev. of: Abrams, LeRoy. **Illustrated flora of the Pacific States, Washington, Oregon and California.** Vol. 1. *xii* + *557 p.* Stanford Univ. Press: Stanford Univ., California, 1923 (see Bot. Absts. 13, Entry 1235).] Science 60: 160–161. 1924. (See also Bot. Absts. 13, Entry 528.)

3029. Hutchinson, J. **Contributions towards a phylogenetic classification of flowering plants.** I. Kew Bull. 1923: 65–89. *2 fig.* 1923.—This article includes a short account of systems of classifications, particularly the system of Bentham and Hooker and of Engler and Prantl, also considerations for the delimitation of groups of families, of families, of genera, and the general principles adopted for the classification of flowering plants. There is a given a brief outline of the classifications of genera of Ranunculaceae by Jussieu, De Candolle, Endlicher, Bentham and Hooker, Baillon, and Prantl. There is also a short account of the geographical distribution of the Ranunculaceae which occur in nearly every part of the globe but are most abundant in species and individuals in the temperate regions of the northern hemisphere. Keys are given for the 6 tribes and 48 genera recognized. The article concludes with an enumeration of Ranunculaceae, giving the approximate number of species and type species of each genus, the distribution, and useful taxonomic literature. The genera with large number of species are *Aquilegia*, 80; *Delphinium*, 230; *Aconitum*, 250; *Ranunculus*, which is cosmopolitan, 300; *Thalictrum*, 100; *Anemone*, which includes *Pulsatilla*, 180; and *Clematis*, 230. There are 12 monotypic genera and 5 genera with only 2 species.—*T. J. Fitzpatrick.*

3030. Hutchinson, J. **Contributions towards a phylogenetic classification of flowering plants, II.** Kew Bull. 1923: 241–261. *16 fig., 2 maps.* 1923.—This article considers only the genera of *Anonaceae*, of which 95 are recognized, *Xylopia* being the only cosmopolitan genus. *Anonaceae* are mostly tropical plants, *Asimina* being the only genus which extends far into the temperate zone. The number of species is about 1150. The subfamilies are *Anonoideae*, with the tribes *Uvarieae* (27 genera), *Miliuseae* (10 genera), and *Unoneae* (56 genera), which include 93 genera; and *Monodoroideae*, containing only 2 genera. Keys are given to the families, tribes, and genera. Each genus is annotated with observations on distribution, type species, and literature.—*T. J. Fitzpatrick.*

3031. Kojima, Hitoshi. **Serobiological relationships between gymnosperms and dicotyledons.** (Japanese.) Bot. Mag. Tôkyô 35: (247)–(252). 1921. [See Bot. Absts. 11, Entry 3082.]

3032. Litardière, R. de. **Note a propos du nombre des chromosomes chez le Senecio vulgaris L.** [**The number of chromosomes in S. vulgaris.**] Bull. Soc. Bot. France 69: 20–21. 1922.

3033. Merrill, E. D. **Bibliography of Polynesian botany.** Bernice P. Bishop Mus. Bull. 13. *1–68.* 1924.—(For abstract see Bot. Absts. 14, Entry 1141.)

3034. Shear, C. L. **The failure of the principle of priority to secure uniformity and stability in botanical nomenclature.** Science 60: 254–258. 1924.—The principle has failed because of the lack of uniformity in interpreting and adopting codes, because it is not easy to apply the rules, because many of the users are practical workers who oppose the needless confusion and change, and because of the failure of the method of type specimens. A satisfactory method of determining nomenclature would be to have an international committee prepare a list of genera and species to be adopted, assign type species and cite type specimens, with due recognition of usage.—*C. J. Lyon.*

PTERIDOPHYTES

3035. Offner, Jules. **Sur les Botrychium du massif du Mont-Blanc.** [**Species of Botrychium on the mountain-mass of Mont Blanc.**] Bull. Soc. Bot. France 69: 7–9. 1922.—The author discusses 4 old species of *Botrychium* found in this region.— *P. A. Young.*

3036. Sampaio, A. J. de. **O grupo especifico Grandifolia no gen. Hemitelia R. Br. (Cyatheaceas) e a nova especie Hemitelia Uleana A. Samp.** [**The "grandiflora" group of Hemitelia, and Hemitelia Uleana, n. sp.**] Bol. Mus. Nacion. Rio de Janeiro 1: 61–67. *Fig. 1–2.* 1923.—The following forms of the species *Hemitelia grandifolia* (Willd.) Spreng. are distinguished: (1) typical, *Cyathea grandifolia* Willd.; (2) var. *insignis* (Fée); (3) var. *imrayana* (Hook.). Among the species noted as belonging to the "grandifolia" group, but considered as distinct is *Hemitelia Uleana* A. Samp. n. sp.—*Edith K. Cash.*

3037. Sampaio, A. J. de. **O valor taxinomico da indusia nas Cyatheaceas. [The importance of the indusium in the taxonomy of the Cyatheaceae.]** Bol. Mus. Nacion. Rio de Janeiro **1**: 13–22. *Fig. 1–5.* 1923.—The slight basis of distinction between the 3 genera of this family (*Cyathea, Hemitelia,* and *Alsophila*) is noted. The character of the indusium may vary so widely in individuals of the same species that its generic position is doubtul; that is, a specimen may be classified as *Alsophila, Hemitelia,* or *Cyathea,* according as the indusium is absent, reduced to a scale, or entire. The position of various authors (Diels, Maxon, Christensen, etc.) on the question is stated, but the author's own conclusions are not given.—*Edith K. Cash.*

SPERMATOPHYTES

3038. Battandier, J. A. **Chrysanthemum gaetulum species nova.** Bull. Soc. Bot France **69**: 214–215. 1922.—The new species of *Chrysanthemum* here described was collected in France.—*P. A. Young.*

3039. Blaringhem, L. **Sur les formes de la Lychnide dioïque et sur l'hérédité de la couleur des fleurs dans cette espèce. [The dioecious forms of Lychnis and the inheritance of flower color in in L. dioica.]** Bull. Soc. Bot. France **69**: 340–347. 1922.

3040. Braun-Blanquet, J. **Études sur la végétation Méditerranéenne. II. Herborisations dans le midi de la France et dans les Pyrénées méditerranéennes. [Studies on the Mediterranean vegetation. II. Botanizing in the south of France and in the Mediterranean Pyrenees.]** Ann. Conservatoire et Jard. Bot. Genève **21**: 25–47. 1919.—Notes are given on many species and the following are described as new: *Minuartia Diomedis,* summit of Cevennes Mountains; *Dianthus graniticus* Jord. × *monspessulanus* L. (*D. Flahaulti* n. hyb.); *Hieracium lesurinum,* Lozère, Mt. Causse-d'Ayres.—*A. S. Hitchcock.*

3041. Camus, A. **Les affinités du genre Neohouzeaua A. Camus. [The affinities of the genus Neohouzeaua.]** Bull. Soc. Bot. France **69**: 291–293. 1922.—This is a discussion of the floral structures and taxonomic position of the recently published genus, mentioned in the title.—*P. A. Young.*

3042. Candolle, C. de. **Piperaceae Bakerianae, e Brasilia. [Baker's Piperaceae from Brazil.]** Ann. Conservatoire et Jard. Bot. Genève **21**: 225–227. 1920.—The collection was made by C. F. Baker. The new species are: *Piper Bakerianum,* Pará, Baker 63; *P. carniovarium,* Pará, Baker 1115; *Piper marcoanum,* Pará, Baker 81; *P. carniconnectivum,* Pará, Baker 72.—*A. S. Hitchcock.*

3043. Candolle, C. de. **Piperaceae Celebicae novae. [New Celebes Piperaceae.]** Ann. Conservatoire et Jard. Bot. Genève **21**: 297–304. 1920.—The following new species are described: *Piper silvimontanum,* Wawo Kraeng, Warburg 16856; *P. Minahassae* Koord., prov. Minahassa, Koorders; *P. Koordersii,* Menado district, Koorders 18497*β*, 18500*β*, 18508*β*; *P. Djabia,* Sapékong-Bonthain, Teysmann 13714; *P. bojonyum,* Bojony, Warburg 15456; *P. Sarasinorum,* Lokon, Sarasin 499; *P. procerifolium* Halmaheira, Teysmann 5643; *P. tomohonum,* Tomohon, Sarasin 548; *P. acutibracteum,* Balch-angin, Teysmann 12385; *P. bonthainense,* Lonjenga-Bonthain, Teysmann 13655; *P. kreangense,* W. Kreang, Warburg 16854; *P. villirameum,* Bojony, Warburg 15450; *Peperomia carnicaulis,* Fjamba, Teysmann 12785.—*A. S. Hitchcock.*

3044. Candolle, C. de. **Piperaceae Colombianae et Peruvianae novae vel nuper lectae. [New or recently collected Piperaceae from Colombia and Peru.]** Ann. Conservatoire Jard. Bot. Genève **21**: 229–249. 1920.—The following new species and varieties are described: *Piper subcrenulatum,* Santa Marta, Smith 1233; *P. huilanum,* Colombia, Huila, Pittier 1230; *P. colombianum,* Colombia, Hartweg 1400; *P. santa-martanum,* Santa Marta, Smith 1230; *P. heterotrichum,* Colombia, Cordoba, Pittier 567; *P. puberulibracteum,* Santa Marta, Smith 1237; *P. villibracteum,* Santa Marta, Smith 384; *P. gracilispicum,* Venezuela, ins. Margaretá, Miller & Johnston 216; *P. crassinervium* Kunth var. *Hartwegianum; P. Apollinaris,* Bogota, Fr. Apollinaire 513; *P. camphoriferum,* Peru, Quebradas de Chihuangala, Pilger 37; *P. espejuelanum,* Colombia, Espejuelo, Pittier 986; *P. argillicola,* Colombia, Langlassé 52; *P. politum,* Peru, Spruce 4137; *P. asperulibaccum,* Colombia, San Andrès de la Sierra, Pittier 1672; *P. exserens* C.DC. vars. *tocotanum* and *mirafloresanum; P. pubinervulum,* Huancabamba, Weberbauer 6093; *P. leptostilum,* Bolivia, Yapacani, Kuntze VI, 1892; *P. paezanum,* Colombia,

Huila, Pittier 1232; *P. scutilimbum*, Santa Marta, Smith 1235; *P. insignifolium*, Colombia, Cuesta de Tocota, Pittier 712a; *Peperomia Salvaje*, Caracas, Preuss 1695; *P. psilostachya* C.DC. var. *subobovatilimba; P. puberulilimba*, Santa Marta, Smith 1259; *P. angulata* Kunth var. *parvifolia; P. Seleri*, Lima, Seler 262, and Cerro de San Cristobal, Seler 250; *P. blanda* Kunth var. *magnifolia; P. Hartmanni*, Colombia, Hartmann, herb. Cand.; *P. longipes*, Santa Marta, Smith 2527; *P. velutina* Linden var. *lanceolata; P. Williamsii*, Bolivia, Jolapampa, Williams 2652; and *P. Heydei* C.DC. var. *brevipeduncula.*—*A. S. Hitchcock.*

3045. Candolle, C. de. **Piperaceae e Borneo et e Sumatra novae aut nuper repertae.** [New or recently discovered Piperaceae from Borneo and Sumatra.]—Ann. Conservatoire et Jard. Bot. Genève 21: 279–295. 1920.—The following new species are described: *Piper gibbiflorum*, Borneo, Sarawak, Haviland; *P. batuanum*, Batoe Is., Raap 635; *P. parvantherum*, Sarawak district, Hose 5?5; *P. Hewilandi*, Mt. Buan, Haviland & Hose 293c, and Sarawak River, Haviland; *P. acutistipulum*, Sumatra, hort. Bogor, cult.; *P. padangense*, Prov. Padang, Beccari 771; *P. glaberrimum*, Sumatra, hort. Bogor. cult.; *P. baramense*, Sarawak, Hose 231; *P. velutibracteum*, La Baku, Labuk Bay, Ridley; *P. dempoanum*, Mt. Dempo, Sumatra, Forbes 2549a; *P. sarawakanum*, Sarawak, Native collector 2589; *P. Raapii*, Ins. Batoe, Raap 240; *P. Beccarii*, Borneo, Beccari 2704; *P. Gagarvum*, Bangka, Teysmann; *P. Hosei*, Borneo, Sibu, Haviland & Hose 3294; *P. bangkanum*, Ins. Bangka, Teysmann; *P. matanganum*, Borneo, Matang; *P. caninum* Bl. var. *glabrilimbum; P. pallidirubrum*, Sumatra, above lake Ranan, Forbes 2121; *P. landakanum*, Landak, Teysmann 1153h; *P. hispidiramum*, Sarawak, Native coll. 2128; *P. villipedunculum*, Ins. Batoe, Raap 223, 274, 307, 467, 557, and Borneo, Bachit Karsin, Neuwenhui Amdjah 60, 258; *P. bullatum*, Borneo, Singhawang, Teysmann; *P. bistigmatum*, Sumatra, Korthals; *P. albidistigmatum*, Ins. Batoe, Raap n. 698; *Peperomia parvicaulis*, Sumatra, Fort of Mt. Dempo, Forbes 2172; *P. Beccarii*, Prov. Padangi, Beccari 752.—*A. S. Hitchcock.*

3046. Candolle, C. de. **Piperaceae Ecuadorenses novae vel nuper lectae.** [New or recently collected Piperaceae from Ecuador.] Ann. Conservatoire et Jard. Bot. Genève 21: 251–270. 1920.—The following new species are described: *Piper nieblyanum*, near Niebly and S. Florencio, Sodiro 45; *P. cuspidilimbum*, Ecuador, Sodiro 1/24; *P. æquale* Vahl var. *substenocarpum; P. gualeanum* Sod., Gualea, Sodiro 34; *P. angamarcanum* Sod., Angamarca, Sodiro 43; *P. Jamesoni*, Ecuador (Jameson, h. U. S.); *P. clathratum* Sod., Mt. Pichincha, Sodiro 50; *P. baëzanum* Sod., Baeza, Sodiro, and Villonaca, Pourtmann 56; *P. disparipilum*, volcano Corazon, Sodiro; *P. mindoënse*, Mindo, Sodiro; *P. balaoënse*, Balao, Eggers 14350; *P. Townsendii*, Manchi, Townsend 893; *Peperomia cuspidilimba*, Prov. Imbabura and Esmeraldas, Sodiro 47; *P. galioides* Kunth var. *minutifolia; P. ciliipetiola*, River Machangara (Jameson in h. U. S.); *P. esmeraldana*, Prov. Esmeraldas, Sodiro 64; *P. parvilimba*, Esmeraldas, Sodiro (39) 62; *P. pilicaulis*, Volcano Tunguragua, Sodiro 12/904; *P. leucorrhachis* Sod., Mt. Pichincha and Atacatzo, Sodiro; *P. vulcanicola*, Volcano Tunguragua, Sodiro (43)66; *P. angulariopsis*, Volcano Tunguragua, Sodiro (46)69; *P. cordilimba*, Perucho, Jameson 691; *P. pendulicaulis*, Balao, Eggers 14680; *P. hirtipeduncula*, Mt. Pichincha, Sodiro (48)71, and Valley Nonegal, Sodiro 5; *P. cachabiana*, Prov. Esmeraldas, Sodiro (35)58; *P. erecta*, Elkereo, Eggers 15235; *P. leucanthera*, Prov. Esmeraldas, Sodiro (38)61.—*A. S. Hitchcock.*

3047. Candolle, C. de. **Piperaceae Formosanae novae.** [New Formosan Piperaceae.]. Ann. Conservatoire et Jar. Bot. Genève 21: 221–224. 1920.—The following new species are described: *Piper arboricola* (Faurie 479, 480); *P. subglaucescens* (Henry 715); *Peperomia formosana* (Warburg 9338); *P. laticaulis* (Faurie 481, Urai 626).—*A. S. Hitchcock.*

3048. Candolle, C. de. **Piperaceae Javanicae novae.** [New Javan Piperaceae.] Ann. Conservatoire et Jard. Bot. Genève 21: 271–277. 1920.—The following new species are described: *Piper puberulispicum*, Malabar, Forbes 1015, and Tjibodas, Boerlage; *P. fragiliforme*, Mt. Malabar, Anderson 323; *P. pantjarense*, Mt. Pantjar, near Bogor, Kurz 2434, 2591; *P. krintjingense*, Mt. Krintjing, Zollinger 2950; *P. brevifolium*, Pendalengan, Warburg 276; *P. nigroramum*, Mt. Malabar, King; *P. ciliibracteum* C.DC. var. *tjamentringense; Peperomia hirticaulis*, Goenoeng Warmijin Forbes 646; *P. gedehana*, Gedeh, Dihm; *P. Hallieri*, Volcano Gedeh, Hallier 521; *P. pangerangoana*, Pangerango, Kurz 1792; *P. lasiophylla*, Sumbavi, Warburg.—*A. S. Hitchcock.*

3049. Candolle, C. de. **Piperaceae Mexicanae.** [Mexican Piperaceae.] Ann. Conservatoire et Jard. Bot. Genève 21: 305–322. 1920.—The following new species are described: *Piper udimontanum*, Cuernavaca, Pringle 6828, and Michoacan, Morelia, Fr. Arsène 2508; *P. pachoanum*, Vera Cruz, Jalapa, Pringle 8075; *P. Botteri*, Orizaba, Botteri & Sumichrast 1526; *P. manzanillanum*, Manzanillo, Palmer 1045; *P. Palmeri*, Colima, Palmer 1227; *P. albidiflorum*, El Tabasal, Langlassé 409; *P. Rovirosae*, Sebastian, Rovirosa 473; *P. plumanum*, Oaxaca, Sierra de Pluma, Duguet; *P. tepicanum*, Tepic, Cerro de San Juan, Diguet; *P. Pringlei*, Cuernavaca, Pringle 6824; *P. alluvicola*, Rio Petatlan, Langlassé 664; *P. udicola*, Tabasco, Rovirosa 444; *P. velutinovarium*, Vera Cruz, Puerto de Alvarado, Seler 4499; *P. Rosei*, Sinaloa, Rose 1657, 3234; *P. Michelianum*, El Muleto, Langlassé 215; *P. consociatum*, El Muleto, Langlassé 215; *P. aguilanum*, Santa Rosa near Aguila, Langlassé 248; *Peperomia rupigaudens* prov. Puebla, Chinantla, Liebmann 116; *P. galioides* Kunth var. *crassispica; P. subblanda*, San Luis Potosi, Pringle 3906, and Bolivia, Britton & Rusby 1819; *P. Langlassei*, El Cedral, Langlassé 306; *P. Endlichii*, Vera Cruz, Jalapa, Endlich 1457 p. p.—*A. S. Hitchcock.*

3050. Chermezon, H. **Sur l'existence à Madagascar d'un représentant de la famille Restiacées.** [A representative of the Restiaceae in Madagascar.] Bull. Soc. Bot. France 69: 318–321. 1922.—The author describes *Restio madagascariensis* n. sp.—*P. A. Young.*

3051. Despaty, M. **Nouvelles localités de plantes observées dans les cantons de Corbeil-Sud, de Milly-Nord (Seine-et-Oise) et de Melun-Ouest.** [New localities of plants observed in South Corbeil, North Milly and West Melun.] Bull. Soc. Bot. France 69: 21–29. 1922.—The article contains a long list of species of flowering plants. The author describes the following new varieties: *Silene nutans* L. sub. var. *rubra*, *Silene nutans L.* sub. var. *roseiflora*, and *Polygonatum officinale* All. var. *Costei.*—*P. A. Young.*

3052. Font Quer, P. **Formes noves de plantes.** [New forms of plants.] Mem. Mus. Cienc. Nat. Barcelona Ser. Bot. 1²: 1–14. *Pl. 1–5.* 1924.—The following new species, varieties, combinations, and hybrids of the Spanish flora are included: *Medicago arborea* L. var. *citrina*, *Hippocrepis Bourgaei* (*H. glauca* Ten. subsp. *Bourgaei* Nyman) and var. *commutata* (*H. commutata* Pau), × *Teucrium pugionifolius* (× *T. buxifolium* Schreb. × *T. chamaedrys* L.), *T. oxylepis*, *Caralluma europaea* (Guss.) N. E. Br. var. *confusa*, × *Centaurea Aemiliae* (× *C. aspera* var. *heterophylla* (Willd.) Rouy f. *subinermis* × *C. Seridis* L.), × *C. levantina* (× *C. aspera* var. *heterophylla* (Willd.) Rouy × *C. Calcitrapa* L.), × *C. Olweri* (× *C. diluta* Ait. × *C. pullata* L.), × *Helichrysum mixtum* (× *H. serotinum* Bois. × *H. Staechas* L.), × *Narcissus Pujolii* (× *N. dubius Gouan* × *N. juncifolius* Lag.).—*J. M. Greenman.*

3053. Fries, Rob. E. **Die tropisch-afrikanischen Viola-Arten der abyssinica-Gruppe.** [The tropical African Viola-species of the abyssinica-group.] Acta Horti Bergiani 8: 1–10. *Pl. 1.* 1923.—Specimens of *Viola*, collected on Mt. Kenia and Mt. Aberdare, showed clearly that the *abyssinica*-type consists, in tropical Africa, of 4 species, *V. abyssinica* Steud., and the following new species or combinations: *V. Eminii* (*V. abyssinica* Steud. var. *Eminii* Engl.), *V. duriprati* and *V. Nannae*. Further, *V. abyssinica* Steud. var. *usambarensis* and *V. Eminii* var. *ulugurensis* (*V. abyssinica* Steud. var. *ulugurensis* Engl.) and *V. abyssinica* × *Eminii* are described as new and a key of the whole group is presented.—*O. Heilborn.*

3054. Fries, Rob. E. **Zur Kenntnis der östafrikanischen Echinops-Arten.** [On the East-African species of Echinus.] Acta Horti Bergiani 8: 39–44. *Pl. 1–2.* 1923.—The studies in this paper were based upon material collected in East-Africa by Swedish expeditions in 1920 and 1921–1922. Two new species, *E. aberdaricus* and *E. Luckii*, and a new section of the genus, sect. *Hamolepis*, are described as new.—*O. Heilborn.*

3055. Gadeceau, E. **Deuxième note sur la descendance d'un hybride naturel: Chenopodium album × purpurascens.** [Second note on the descent of a natural hybrid: C. album × purpurascens.] Bull. Soc. Bot. France 69: 231–232. 1922.

3056. Gamble, J. S. **Neohouzeaua, a new genus of bamboos.** Kew Bull. 1923: 89–93. *1 pl.* 1923.—This recently proposed genus was delimited by A. Camus; the chief characters are 1-flowered spikelets and monadelphous stamens. Gamble delimits and proposes as new, *Neohouzeaua tavoyana*, the type locality being Sinyat Hill in Tavoy, Burma, altitude 300 m. Other species discussed are *N. Helferi* (*Bambusa Helferi* Munro) and *N. Dullooa* (*Teinostachyum Dullooa* Gamble).—*T. J. Fitzpatrick.*

3057. Gandoger, Michel. **Plantes de Somalie (Afrique orientale). [Plants of Somaliland.]** Bull. Soc. Bot. France 69: 348–351. 1922.—The author gives descriptions of the following new species of flowering plants: *Corchorus somalicus, Triumfetta Fioriana, T. fazoglensis, Alysicarpus squamosus, Ocimum falcatum, Asytasia somalica, Aerva arachnoides, A. transvaalensis,* and *Sporobolus trichophorus.*—*P. A. Young.*

3058. Grande, L. **Note di floristica. [Floristic notes.]** Nuovo Gior. Bot. Ital. N. S. 31: 105–160. 1924.—The author lists some 101 plants with taxonomic notes continuing his studies [See Bot. Absts. 14, Entry 997.] continued from Ibid. 29: 142-161. 1922. The following new combinations are included: *Angelica altissima* (*Thapsia altissima* Mill.), *Anthyllis Vulneraria* L. var. *hirsutissima* (*Vulneraria heterophylla* Moench b. *hirsutissima* Guss.), *Cirsium eriophorum* (L.) Scop. var. *aprutianum* (*C. eriophorum* subsp. *odontolepis* (Boiss.) var. *aprutianum* Rouy), *Erythraea pumila* (*Gentiana pumila* Gouan), and *Lonas annua* (*Santolina annua* L.)—*P. D. Caldis.*

3059. Hassler, E. **Enumeratio Urticacearum Paraguariensium. [An enumeration of the Urticaceae of Paraguay.]** Ann. Conservatoire et Jard. Bot. Genève 21: 141–143. 1919.—One new variety is described, *Boehmeria ramiflora* Jacq. var. *paraguariensis,* the type of which is Hassler 10498. A new combination is included, namely, *Urera aurantiaca* Wedd. var. *scandens* (*U. scandens* (Monk) Parodi).—*A. S. Hitchcock.*

3060. Hassler, E. **Lauracearum Paraguariensium conspectus. [A review of the Lauraceae of Paraguay.]** Ann. Conservatoire et Jard. Bot. Genève 21: 73–97. 1919.—The following new species are described: *Phoebe paraguariensis,* Santo Tomas Sierra de Amambay, Hassler 11305; *Ocotea confusa,* without definite locality, Hassler 4362, 4362a, 4941, 5900, and Cerro Corá, Hassler 10477; *O. pseudocorymbosa,* Nuverá Sierra de Amambay, Hassler 11416; *Nectandra megaphylla,* Sierra de Amambay, Hassler 10584, 11295; *N. Briquetii,* Limeira Sierra de Amambay, Hassler 11247; *N. membranacea* (*Persea membranacea* Spr.); *N. dubia,* Esperanza Sierra de Amambay, Hassler 11984. The following new varieties and combinations are included: *Ocotea puberula* Nees var. *Arechavaletae* (*O. Arechavaletae* Mez); *O. lanceolata* Nees var. *gracilipes* (*O. gracilipes* Mez); *O. pulchella* Mart. var. *vaccinioides* (*Mespilodaphne vaccinioides* Meissn.); *O. suaveolens* Hassler var. *robusta; Nectandra lanceolata* Nees var. *paraguariensis.*—*A. S. Hitchcock.*

3061. Hassler, E. **Moracearum Paraguariensium conspectus. [A review of the Moraceae of Paraguay.]** Ann. Conservatoire et Jard. Bot. Genève 21: 109–131. 1919.—The following new species are described: *Dorstenia pseudo-opifera,* Brazil, Rio de Janeiro, Brother Allemão; *Pseudolmedia guaranitica,* Sierra de Amambay, Hassler 11374; *Ficus Morongii* (*F. Radula* Morong, not Willd.); *F. Rojasii,* Cordillera de Altos, Hassler 12367; *F. Monckii* (*F. Guapoi minor* (Monck) Parodi, 1878).—*A. S. Hitchcock.*

3062. Hassler, E. **Myrsinacearum Paraguariensium conspectus. [A review of the Myrsinaceae of Paraguay.]** Ann. Conservatoire et Jard. Bot. Genève 21: 99–107. 1919.—The following new species and varieties are described: *Rapanea quaternata,* Santo Tomas Sierra de Amambay, Hassler 11254, 11835. Misiones argentinas, de Llamas 749; *R. Lorentziana* Mez var. *intermedia; R. perforata* Mez vars. *subsessilis* and *rigida;* and *Cybianthus densicomus* Mart. var. *grandifolius.*—*A. S. Hitchcock.*

3063. Hassler, E. **Primitiae Missionum Argentinarum. I. [First contribution on the Argentine Misiones.]** Ann. Conservatoire et Jard. Bot. Genève 21: 217–220. 1919.—There are described as new: *Labatia Osteni* (based on Osten 8289), and *Cratylia floribunda* Benth. vars. *intermedia* and *nuda* (*C. nuda* Tul.).—*A. S. Hitchcock.*

3064. Hassler, E. **Quelques remarques à propos des Graminaceas del Alto Paraná du Dr. Bertoni. [Some remarks on Dr. Bertoni's grasses from the Alto Paraná.]** Ann. Conservatoire et Jard. Bot. Genève 21: 133–139. 1919.—This review of Bertoni's work summarizes the grouping of the 321 species of grasses found in Paraguay. A postscript concerns the synonymy of *Cedrela* in Paraguay.—*A. S. Hitchcock.*

3065. Hochreutiner, B. P. G. **Guttiferae novae vel minus cognitae. [New or little-known Guttiferae.]** Ann. Conservatoire et Jard. Bot. Genève 21: 49–68. 1919.—The following are described as new: *Kielmeyera obovata,* Bahia, Blanchet 980, 1904; *K. longepetiolata,* Minas Geraes, Claussen in 1839; *Eliaea majorifolia,* Madagascar, Martin without no.; *Vismia*

plicatifolia, Bolivia, Coroico, Buchtein 222, Yungas, Bang 595; *V. macrophylla* HBK. var. *glabrescens*, Brazil; *V. Laurentii* De Wild. var. *polyandra*, Kamerun; *Psorospermum lanceolatum* (*Haronga lanceolata* Choisy); *P. revolutum* (*H. revoluta* Choisy); *P. molluscum* (*Arungana mollusca* Pers.); *P. crenatum* (*A. crenata* Pers.); *P. guineense* (*Hypericum guineense* L.); *P. Bakeri* (*P. discolor* Baker, not Spach); *P. corymbiferum*, Senegambia, Heudelot 768; *P. lanatum*, French Guiana, Kollangui, Chevalier 13512; *P. cuneifolium*, Congo, Bangala, Hens 102; *P. Chevalieri*, Oubangui, Chevalier 5840; *P. glaberrimum*, Senegambia, Heudelot 92; *Tovomita longifolia* (*Clusia longifolia* Rich.); *Garcinia Chevalierana*, French Guiana, Kouria, Chevalier 15022.—*A. S. Hitchcock.*

3066. Hochreutiner, B. P. G. **Notes sur les genres Cristaria, Bakeridesia, Malvastrum et sur quelques espèces nouvelles rapportées par E. Wilczek de la République Argentine. [Notes on the genera Cristaria, Bakeridesia, Malvastrum and upon some new species brought by E. Wilczek from the Argentine Republic.]** Ann Conservatoire et Jard. Bot. Genève **21**: 405–428. 1920.—Several new subgenera and sections are described and the following new species: *Cristaria mutica*, prov. de Mendoza, Wilczek 294; *C. chubutensis* (*Sida chubutensis* Speg.); *C. Wilczekii*, prov. Mendoza, Wilczek 295; *C. univittata*, Chile, Hb. Mus. Paris; *Bakeridesia notolophium* (*Abutilon notolophium* A. Gray); *B. rufivela*, Brazil, Nova Friburgo, Glaziou 18136; *B. senilis* (*Abutilon senile* K. Schum.); *Malvastrum Wilczekii*, prov. de Mendoza, Wilczek 290.—*A. S. Hitchcock.*

3067. Hochreutiner, B. P. G. **Notes sur quelques Sterculiacées. [Notes on some Sterculiaceae.]** Ann. Conservatoire et Jard. Bot. Genève **21**: 429–435. 1920.—The following new species are described: *Melochia compacta*, Mariana Islands, Gaudichaud; *M. pseudonodiflora*, Peru and Chile, Ruiz; *Pterospermum Harmandii*, Indo-China, Harmand 609.—*A. S. Hitchcock.*

3068. Hochreutiner, B. P. G. **Notulae in Malvaceas (2nd article).—[Notes on Malvaceae.]** Ann. Conservatoire et Jard. Bot. Genève **21**: 437–452. 1920.—The following new species are described: *Abutilon percaudatum*, Mexico, prov. San Luis Potosi, Palmer 19; *A. glabriflorum*, Mexico, Tamaulipas, Palmer 373; *A. sphaerostaminum*, Zacuapan, Vera Cruz, Purpus 2234; *A. tultitlanapense*, San Luis Tultitlanapa, Puebla, Purpus 3254; *A. subsagittatum*, Mexico, Tamaulipas, Palmer 371; *A. sinense* Oliver var. *yunnanense; A. mochisense*, Las Mochis, prov. Sinaloa, Rose 13329; *Robinsonella subcordata*, Oaxaca, Rusby; *Gaya endacantha*, Andes, Ecuador, Jameson 63.—*A. S. Hitchcock.*

3069. Hughes, D. K. **Orthachne and Streptachne.** Kew Bull. **1923**: 301–303. *4 fig.* 1923.—The author gives the history and synonymy of these 2 genera of grasses, the former proposed by Steudel, the latter by Robert Brown, with some remarks on the species included in each. A new combination is proposed, namely, *Orthachne rariflora* (Hook. f.) Hughes.—*T. J. Fitzpatrick.*

3070. Hughes, D. K. **Paractaenum novae-hollandiae.** Kew Bull. **1923**: 287–289. *6 fig.* 1923.—This is a monotypic genus of Australia, first described by Beauvois. Due to imperfect description doubt has existed as to the validity of the genus. From material in the British Museum an emended description with illustrations is given.—*T. J. Fitzpatrick.*

3071. Hughes, D. K. **Streptolophus, a new genus of Gramineae.** Kew Bull. **1923**: 177–180. *7 fig.* 1923.—This is a monotypic genus, described as intermediate between *Cenchrus* and *Plagiosetum*, with leaf-blades sagittate and inserted on slender petioles; bristles flattish, branched above, more or less fused at base into stalked clusters or fascicles, each cluster becoming reflexed and finally disarticulated. The species is *S. sagittifolius*; here delimited and proposed as new, type locality is Angola, West Tropical Africa.—*T. J. Fitzpatrick.*

3072. Hutchinson, J. **Primula calciphila, the so-called wild form of Primula sinensis.** Kew Bull. **1923**: 97–102. *1 pl., 4 fig.* 1923.—*Primula sinensis* Lindley was discovered in China in 1819, introduced into England in 1820, and formally described in 1821. What has been considered the wild form of this species is now found to be entirely distinct and is delimited and proposed as new with the name *Primula calciphila*, the habitat and type locality being limestone cliffs near Ichang, Hupeh, China. The 3 species *P. sinensis* Lindley, *P. calciphila* Hutchinson, and *P. rupestris* Balf. f. & Farrer are contrasted and differences indicated.—*T. J. Fitzpatrick.*

3073. Jumelle, Henri. **Le Sansevieria canaliculata et le Sansevieria Stuckyi [Sansevieria canaliculata and Sansevieria Stuckyi.]** Bull. Mus. Hist. Nat. [Paris] **29**: 607–612. 1923.—*Sansevieria canaliculata* has been cultivated for a long time in the conservatories of botanical institutions, sometimes under the name of *S. canaliculata* Carrière and sometimes under that of *S. sulcata* Bojer. The author confirms this synonymy contested in 1915 by N. E. Brown. The presence of the species in a wild state is indicated in Madagascar in the bay of Ampasindava on the northwest coast opposite to Nossi-Bé where it is supposed to be indigenous under the name of *votoposa*. But this species is evidently introduced and without doubt was brought by the Arabs from the east coast of Africa first to Comores, then to Mihilaka at the back of the bay of Ampasindava. Up to now the flowers of *Sansevieria Stuckyi* Godef. have been unknown, but the plant has bloomed in the greenhouses of the Botanical Garden of Marseille. The large flowers are grouped on an inflorescence about 30 cm. long with an axis naked only about 16 cm. The perianth tube is vivid rose about 10 cm. long and is surmounted with white lobes about 4 cm. long. This species has very large flowers like those of *S. Kirkii* Baker and *S. longiflora* Sims.—*Author.*

3074. León, H. **A new Cuban Sida.** Mem. Soc. Cubana Hist. Nat. "Felipe Poey" **5**: 70–72. 1923.—*Sida Brittoni* Fr. Léon is redescribed as in Torreya. **19**: 172. 1919.—*J. A. Faris.*

3075. Miyabe, Kingo, and Yushun Kudo. **Materials for a Flora of Hokkaidô X.** Trans. Sapporo Nat. Hist. Soc. **8**: 1–8. 1921.—The following plants found in Hokkaidô are enumerated, each new species being described: *Athyrium Yamadae* n. sp., *Melica striata* Hitchcock, *Juncus Tokubuchii* n. sp., *Scilla Thunbergii* (*Ornithogalum japonicum Thunb.*) n. name, *Sedum Ishidae* n. sp., *Corydalis ochotensis* Turcz., *Mitella integrifolia* Boiss., *Gentiana Igarashii* n. sp., *Senecio otophorus* Maxim., and *Picris crepioides* n. sp.—*S. Ikeno.* (*Courtesy Japanese Jour. Bot.*)

3076. Morris, P. F. **A new species of Brachycome.** Victorian Nat. **41**: 31. *Pl. 1.* 1924.—*B. alpina*, resembling *B. scapiformis* DC., is described, and is to be classed next to *B. trachycarpa* F.v.M.—*Wm. Randolph Taylor.*

3077. Mugnier, Louis. **Rosa glauca Vill. en Haute-Marne. [R. glauca of the upper Marne.]** Bull. Soc. Bot. France **69**: 371–372. 1922.—Besides discussing this species, the author comments on several other species of *Rosa*, including a description of *R. lagenarioides* Coste & Mugnier.—*P. A. Young.*

3078. Nakai, Takenoshin. **Labiatae Koreanae. [Labiatae of Korea.]** Bot. Mag. Tôkyô **35**: 169–183, 191–205. 1921.—This is an enumeration of all species and varieties of the Korean mint family. It comprises 61 species and 15 varieties belonging to 25 genera. Among them the following are new: *Galeopsis bifida* Boenning. var. *emarginata*, *Glechoma hederacea* L. var. *longituba*, *Mentha haplocalyx* Briq. var. *barbata*, *Mosla leucantha* and var. *robusta*, *Plectranthus inflexus* (Thunb.) Vahl. vars. *canescens* and *microphyllus*, *Scutellaria asperiflora*, *S. tuminensis*, *Thymus Przewalskii* and var. *magnus*.—*Author.* (*Courtesy Japanese Jour. Bot.*)

3079. Nakai, Takenoshin. **Notulae ad Plantas Japoniae et Koreae XXIV. [Notes on plants of Japan and Korea. XXIV.]** Bot. Mag. Tôkyô **35**: 131–138. 1921. In this paper the author has described 13 new species and 3 new varieties of Japanese and Korean plants. They are as follows: *Athyrium heterocarpum*, *A. subimbricatum*, *Dryopteris coreano-montana*, *Krascheninnikowia bulbosa*, *Arctous japonica*, *Rhododendron yakushimanum*, *Diospyros Kuroiwai*, *Veronica amplectens*, *Xanthoxylum Arnottianum* Maxim. v. *alatum*, *Liparis hachijoensis*, *Ammannia discolor*, *Vaccinium axillare*, *Symplocos lithocarpoides*, *Diospyros nipponica*, *Krascheninnikovia Palibiniana* Takeda v. *polymera*, *Leucothoe Grayana* Maxim. v. *hypoleuca*.—*Author.* (*Courtesy Japanese Jour. Bot.*)

3080. Nakai, Takenoshin. **Notulae ad Plantas Japoniae et Koreae XXV. [Notes on plants of Japan and Korea. XXV.]** Bot. Mag. Tôkyô **35**: 139–153. 1921.—This contains the following 18 new species and 4 new varieties of Japanese and Korean plants: *Bromus jaluanus*, *Diplachne latifolia*, *Pilea Taquetii*, *P. oligantha*, *Lychnis fulgens* Fischer var. *glabra*, *Euonymus kawachiana*, *Chrysanthemum leiophyllum*, *Diplazium hachijoense*, *Selaginella hachijoensis*,

Trisetum biaristatum, Rubus hachijoensis, Viburnum japonicum (Thb.) Spreng. var. *fruticosum, Calamagrostis villosa* Mutel v. *ramosa, Chenopodium koraiense, Mucuna Toyoshimai, Hanausaya latisepala, Cirsium calcicolum, Woodwardia exaltata, Calamagrostis longiseta* Hackel var. *heterogluma, Dianthus hachijoensis, Ligustrum pacificum, Rhododendron boninens.*—*Author.* (*Courtesy Japanese Jour. Bot.*)

3081. Nakai, Takenoshin. **Notulae ad Plantas Japoniae et Koreae XXVI.** [Notes on plants of Japan and Korea XXVI.] Bot. Mag. Tôkyô 36: 19–26. 1922.—(1) Descriptions of the following new species are given: *Eria yakushimensis, Polygala hondoensis, Trachelospermum foetidum, Callicarpa okinawensis, Ligustrum Quihoui* Carrier var. *latifolium, Abeliophyllum distichum* Nakai f. *albiflorum et* f. *lilacinum.*—(2) *Fimbristylis annua* is specifically distinct from *F. diphylla.*—(3) The reduction of doubled names to the proper ones is as follows: *Callicarpa parvifolia* Hayata to *Callicarpa randaiensis* Hayata, *Lactuca tamagawensis* Makino to *Prenanthes graminea* Fischer or *Ixeris graminea* Nakai, *Clerodendron koshunense* Hayata to *Clerodendron Fargesii* Dode, *Hydrocotyle Yabei* Makino to *Hydrocotyle nitidula* A. Richard.—(4) Discrimination of 4 allied genera *Lactuca, Ixeris, Myceles* and *Paraixeris* by the shape of their achenes, is made, and also a discrimination of *Benninghausenia japonica* and *B. albiflora.*—*Author.* (*Courtesy Japanese Jour. Bot.*)

3082. Nakai, Takenoshin. **Notulae ad Plantas Japoniae et Koreae XXVII.** [Notes on plants of Japan and Korea. XXVII.] Bot. Mag. Tôkyô 36: 61–73. 1922.—In this article the author has described 19 new plants as follows: *Quercus neo-glandulifera,* Corean Archipelago; *Quercus stenophylla* var. *latifolia,* Corean Archipelago; *Dianthus superbus* var. *alpestris,* Hondo; *Daphniphyllum macropodum* var. *viridipes,* Hondo; *Buxus microphylla* var. *insularis,* Corean Archipelago; *Rosa kokusanensis,* Corean Archipelago; *Rosa tsusimensis,* Tsusima and Corean Archipelago; *Lespedeza latissima,* Hondo and Quelpaert; *Lespedeza prostrata,* Hondo and Tsushima (this scientific name should be changed to *Lespedeza serpens* as there is already a plant called *Lespedeza prostrata* in North America); *Rhus rishiriensis,* Isl. Rishiri; *Otherodendron liukiuense,* Liukiu; *Hypericum hachijoense,* Isl. Hachijo; *Vitis ficifolia* var. *pentaloba,* Hondo; *Viola Kishidai,* Hondo; *Phyllodoce nipponica* var. *gracilis,* Hondo; *Rhododendron mucronulatum* var. *latifolium,* Corean Archipelago; *Tripetaleia paniculata* var. *barbinervis,* Hondo; *Saussurea rorinsanensis,* Corea; *Saussurea sinuatoides* var. *serrata,* Hondo. Also each of the following species is added to the flora of the respective lands mentioned below: *Adiantum Farleyense,* Bonin; *Bromus Porteri,* Kamtschatka; *Carex Parrayna,* Kamtschatka; *Carex Raynoldsii,* Kamtschatka; *Corylus hallaisanensis,* Hondo; *Quercus Fabri,* Corean Archipelago; *Spirea Yatabei* var. *latifolia,* Corean Archipelago; *Elaeagnus maritima,* Corean Archipelago; *Daucus littoralis,* Corean Archipelago; *Rhododendron obtusum,* Kiusiu; *Melampyrum roseum* var. *ciliare,* Corean Archipelago; *Brachyactis ciliata,* Hondo; *Ligularia stenocephala,* Corean Archipelago; *Paraixeris denticulato-platyphylla,* Corean Archipelago. The change of scientific names is as follows: *Rosa rubrostipullata* Nakai to *Rosa Marretii* Léveillé; *Vitis dentata* Hayata and *Vitis bioritsensis* to *Tetrastigma erubescens* Planchon; *Vitis formosana* Hemsley to *Tetrastigma formosana* Nakai; *Vitis umbellata* Hemsley and *Vitis arisanensis* Hayata to *Tetrastigma umbellata* Nakai; *Erigeron alpicolus* Makino to *Erigeron glabratus* Hoppe & Hornschuch. A key to all species of *Rosa* of Japan belonging to section Systylæ is given.—*Author.* (*Courtesy Japanese Jour. Bot.*)

3083. Nakai, Takenoshin. **Praecursores ad Floram Sylvaticam Koreanam XI.** Bot. Mag. Tôkyô 35: 1–18. 1921.—The author classifies the Korean Sarmentaceous, Tiliaceous and Elaeocarpaceous plants which belong to 3 families and 6 genera, numbering 17 species and 7 varieties in all. Among them *Tilia rufa, T. semicostata* and *T. ovalis* are new species, and *Psedera Thunbergii, Vitis ficifolia* var. *Thunbergii, Vitis amurensis* var. *Coignetii* are new combinations of names. *Ampelopsis heterophylla* var. *ciliata,* a new plant of Formosa, is added. He includes also a Formosa plant, *Vitis adstricta* Hance, which Hayata considered to be *Vitis Labrusca* var. *Thunbergii.*—*Author.* (*Courtesy Japanese Jour. Bot.*)

3084. Nakai, Takenoshin. **Violae Novae Japoniae.** [New Japanese violets.] Bot. Mag. Tôkyô 36: 29–39. 1922.—In this paper the following new species from the Japanese domains are described: *Viola xanthopetala, V. hidakana, V. conferta, V. yubariana, V.*

alliariæfolia, *V. lasiostipes*, *V. kurilensis*, *V. Hideoi*, *V. hichitoana*, *V. takesimana*, *V. yakusimana*, *V. lutchuensis*, *V. kapsanensis* and var. *albiflora*, *V. nikkoensis*, *V. oblongo-sagittata* and var. *violascens*, *V. boninensis*, *V. taiwanina*, *V. niijimensis*, and *V. stenocentra* Hayata.—*Author.* (*Courtesy Japanese Jour. Bot.*)

3085. Pau, Carles. **Nueva contribución al estudio de la flora de Granada.** [**New contribution to the study of the flora of Granada.**] Mem. Mus. Cienc. Nat. Barcelona. Ser. Bot. 1¹: 1–74. *Pl. 1–10.* 1922.—The author records the results of a critical study of an extensive series of vascular plants from Granda, Spain. An annotated catalogue is given of 640 species, varieties, and hybrids. The following are indicated as new to science: *Thalictrum Albinii*, *Alyssum montanum* L. var. *almijarrense*, *Iberis Fontqueri*, *I. Grosii*, *Helianthemum atriplicifolium* Willd. var. *Estremerae*, *H. alyssoides* (Lam.) Vent. var. *ambiguum*, × *H. texedense* (*H. appeninum* × *glaucum*), *Ruta montana* L. var. *baetica*, *R. chalepensis* L. var. *granatensis*, *Ilex Aquifolium* L. var. *Barcinonae*, *Sarothamnus rotundatus*, *Anthyllis Vulneraria* L. var. *megaphylla*, *Onobrychis longiaculeata* (Boiss.) Pau var. *villosa*, *Tamarix calarantha*, *Saxifraga biternata* Boiss. var. *major*, *S. globulifera* Desf. var. *acutiloba*, *Danaa cornubiensis* (L.) Samp. var. *granatensis*, *Knautia granatensis*, *Hieracium texedense*, *Antirrhinum leiocalyx*, *Salvia malacitana*, × *Thymus Fontquerianus* (*T. hirtus* × *mastichina* Pau), and *Ornithogalum granatense.*—*J. M. Greenman.*

3086. Pellegrin, Fr. **La flore du Mayombe d'après les récoltes de M. Georges Le-Testu, Administrateur de Colonies.** [**A flora of Mayombe, French Congo, based on the collections of George Le Testu, Administrator of the Colonies.**] Mem. Soc. Linn. Normandie **26**: 1–126. *Pl. 4–11, 8 fig.* 1924.—The present paper concerns the dialypetalous dicotyledons, namely, the families Ranunculaceae to the Umbelliferae inclusive. The following new genera and species are included: *Isolona LeTestui*, *Xylopia LeTestui*, *Uvaria gabonensis* E. & D. var. *grandiflora*, *U. LeTestui*, **Letestudoxa** n. gen. of the Anonaceae, *L. bella*, *L. grandifolia*, **Pseudartabotrys** n. gen. of the Anonaceae, *P. LeTestui*, *Rinorea Sereti* De Wild. var. *grandiflora*, *Lindackeria ngounyensis*, *Homalium LeTestui*, *Garcinia LeTestui*, *G. ngounyensis*, *G. nyangensis*, *Bombax Chevalieri*, *Scaphopetalum LeTestui*, *S. ngounyense*, *Sterculia bayakensis*, *Cola itsoghensis*, *C. LeTestui*, *Pterygota Augouardii*, *Citropsis LeTestui*, *Klainedoxa gabonensis* Pierre var. *microphylla*, **Testulea** n. gen. of the Luxembourgiaceae, *T. gabonensis*, *Pachylobus ferruginea* A. Chev., *P. heterotricha*, *P. LeTestui*, *Guarea mayombensis*, *Dichapetalum LeTestui*, *D. malembense*, *D. nyangense*, *Tapura LeTestui*, *Rhaptopetalum sindarense*, *Olax minquartioides* H. Baill., *Raphiostyles fusca* Pierre var. *villosa*, *Salacia bayakensis* (*S. LeTestui* Pellegrin), *S. LeTestuana*, *Placodiscus candatus* Pierre, **Bizonula** n. gen. of the Sapindaceae, *B. LeTestui*, *Poncovia floribunda*, *Sorindeia LeTestui*, *S. tchibangensis*, *Trichoscypha nyangensis*, *T. parviflores*, *Cnestis leucanthoides*, *Milletia Klainei* Dunn var. *floribunda*, *M. LeTestui*, *Leptoderris ferruginea* De Wild. var. *LeTestui*, *L. fasciculata* (Benth.) Dunn var. *pauciflora*, *Baphia LeTestui*, *Macrolobium LeTestui*, *M. limosum*, *M. mayombense*, *M. ngounyense*, *Detarium LeTestui*, *Cynometra nyangensis*, **Augouardia** n. gen. of the Leguminosae, *A. Le Testui*, *Parinarium ingangense*, *Combretum itsoghense*, *Syzygium marounzense*, *Petalonema glanduligerum*, and *Memecylon pulcherrimum* Gilg var. *ovalifolium.*—*J. M. Greenman.*

3087. Reynier, Alfred. **A propos d'une variété marocaine transiens de l'Adenocarpus telonensis (Lois. sub Cytiso) De Candolle.** [**A Moroccan variety, Adenocarpus telonensis transiens.**] Bull. Soc. Bot. France **69**: 11–16. 1922.—The author names this new variety: *A. telonensis transiens.*—*P. A. Young.*

3088. Reynier, Alfred. **Semi-hermaphroditisme chez le Mercurialis annua L., sur tous les pieds dits femelles du Type et de la Forme ambigua.** [**Semi-hermaphroditism in M. annua; the so-called female lines of the type, and the form ambigua.**] Bull. Soc. Bot. France **69**: 454–462. 1922.—This article is a detailed discussion of the seasonal variation in the hermaphroditism of this species and form with a consideration of abnormalities.—*P. A. Young.*

3089. Riley, L. A. M. **Contributions to the flora of Sinaloa: I.** Kew Bull. 1923: 103–115. 1923.—Sinaloa is a state in northern Mexico on the Pacific littoral. The introduction treats of physical and climatic conditions and previous work done. One hundred and seven species are listed and more or less fully annotated. The following species are delimited and proposed as

new: *Halimium concolor*, *Polygala sinaloensis*, *Anoda urophylla*, and *Triumfetta sanctae-luciae*, the last species delimited by Sprague. A new species is indicated in the genus *Sapranthus* but is neither delimited nor named.—*T. J. Fitzpatrick.*

3090. Riley, L. A. M. **Contributions to the flora of Sinaloa: II.** Kew Bull. 1923: 163–175. 1923.—Results of a further study of the flora of a state in northwestern Mexico are recorded. New species described by the author are: *Rhamnus dianthes*, Sierre Madre; *R. Gonzalezii*, San Ignacio, Cerro de la Nanche, San Augustin; new species by Sprague and Riley are: *Bursera lonchophylla*, Cerro del Muerto; *B. stenophylla*, the type from Hacienda San Miguel, southwestern Chihuahua; *B. acutidens*, type from Manzanillo, Colima; *B. sphaerocarpa*, type from Acapulco, Guerrero. New combinations by Riley are: *Oxalis lanceolata* (Small), *O. primavera* (Rose), *O. Trientalis* (Small), *O. yucatanensis* (Rose), *Bursera arborea* (Rose), *B. attenuata* (Rose), *B. occidentalis* (Rose), *B. pilosa* (Engler), *B. rubra* (Rose), and *Comocladia macrophylla* (Hook. & Arn.).—*T. J. Fitzpatrick.*

3091. Riley, L. A. M. **Contributions to the flora of Sinaloa: III.** Kew Bull. 1923: 333–346. 1923.—The entire article is given to the Leguminosae, subfamily Papilionaceae. All the species listed are fully annotated. The following are delimited and proposed as new by Riley: *Crotalaria polyphylla*, *Tephrosia hypoleuca*, *T. pachypoda*, all from Sierre Madre; and the following by Sprague and Riley: *Crotalaria rotundifolia* var. *brachytricha*, Cerro de Pinal; *Lupinus delicatulus*, Sierre Madre; and *Hosackia madrensis*, Sierre Madre. Riley proposes the following new combinations: *Dalea Goldmani*, *D. occidentalis*, *D. Palmeri*, *D. pumila*, *D. roseiflora*, *D. sericocalyx*, *Tephrosia Brandegei*, *T. foliolosa*, and *T. submontana*.—*T. J. Fitzpatrick.*

3092. Sennen, Le Frère. **Quatre nouvelles plantes de la flore barcelonaise (Onobrychis saxatilis Lamk., Euphorbia Carullae Sennen, Humulus Lupulus L., Aegilops Fonsii Sennen). [Four new plants of the flora of Barcelona: O. saxatilis, E. Carullae, H. Lupulus, and A. Fonsii.]** Bull. Soc. Bot. France 69: 89–96. 1922.—The author describes the new species: *Euphorbia Carullae* and *Aegilops Fonsii*.—*P. A. Young.*

3093. Sprague, T. A. **Notes on Heliocarpus.** Kew Bull. 1923: 348–351. 1923.—Critical notes are given on *Heliocarpus glanduliferus* Robins., *H. mexicanus* (Turcz.) Sprague, *H. appendiculatus* Turcz., and *Triumfetta arborescens* (Seem.) Sprague, a new combination. *Heliocarpus costaricensis* from the banks of the Rio Torres, at San Francisco, province of San José, Costa Rica, and *H. chontalensis*, from forests of Chontales, Nicaragua, are delimited and proposed as new species.—*T. J. Fitzpatrick.*

3094. Vilmorin, Jacques de. **Hybrides de Primula Juliae. [Hybrids of P. Juliae.]** Bull. Soc. Bot. France 69: 206–210. 1922.

REVISIONS AND MONOGRAPHS

3095. Burtt-Davy, J., and J. Hutchinson. **A revision of Brachystegia.** Kew Bull. 1923: 129–163. *1 pl., 13 fig.* 1923.—The genus *Brachystegia* is confined to equatorial Africa. The species are mostly found in the dry savannah forests of the great central plateau, especially the portion lying between Angola and Nyasaland. A large proportion of the species are endemic in a single state. This revision recognizes 54 species, 17 of which are here described for the first time. Information is given on the economic value of the Brachystegias as fiber, bark-cloth, and timber, also on the general features of the Brachystegia forest, with vernacular names and a key to the species. The following species are recognized as new, full descriptions being given: *B. Taubertiana*, Tanganyika Territory, Usambara, Doda; *B. filiformis*, N. W. Rhodesia, Broken Hill (type); *B. glaucescens*, Belgian Congo, S. Rhodesia, Umtali division (type), *B. Gossweileri*, Angola, near Fort Princess Amelia; *B. mimosaefolia*, Belgian Congo, N. W. Rhodesia, Broken Hill (type); *B. reticulata*, S. Rhodesia, Umtali division, Odzani river valley (type), Portuguese East Africa; *B. apertifolia*, Belgian Congo, Nyasaland (type), Angola; *B. utilis*, Nyasaland, Mlanje (type), Portuguese East Africa, Belgian Congo, Angola; *B. puberula*, Angola; *B. leonensis*, Sierra Leone; *B. Allenii*, Portuguese East Africa, sandy hills at mouth of mSala River (type), Tanganyika Territory; *B. venosa*, Uganda, N. W. Rhodesia, Highveld near the Victoria Falls (type); *B. Bakeriana*, Angola, Ganguella country, east of Kubango River (type); *B. obliqua*, Angola, between T'Chiran-

dongombe and River Longa (type); *B. Gairdnerae*, N. W. Rhodesia, Sesheke District; *B. edulis*, Kenya Colony, Tanganyika Territory, Nyasaland, N. W. Rhodesia, highlands of Batoka country (type), S. Rhodesia; and *B. Lujae* De Wild. mss., Belgian Congo, forests of the Sankuru.—*T. J. Fitzpatrick.*

3096. Chipp, T. F. **New species of Rinorea from west Africa.** Kew Bull. 1923: 289–299. 1923.—*Rinorea* is a genus of the family Violaceae. In the Flora of Tropical Africa (1868) only 13 species are given, at present about 100 are known. Their distribution is about as follows: 62 in Upper Guinea, 30 in the remainder of Tropical Africa, and about 10 in Madagascar and the Mascarine Isles. In Upper Guinea the greatest number, 39, is found in the Cameroons. A revision of the Upper Guinea species was made in connection with a study of the west African forest region. The following new species are described: *Rinorea subauriculata*, Kongui River, Cameroons; *R. kibbiensis*, Kibbi hills, Gold Coast; *R. oblanceolata*, Begwai, Liberia; *R. punctata*, Eket District, Nigeria; *R. verrucosa*, Forest Hill, Efulen, Cameroons; *R. breviracemosa*, Sierra Leone; *R. Aylmeri*, Pujehun, Sierra Leone; *R. pilosa*, Oban, southern Nigeria; *R. rubrotincta*, Begwai, Liberia; *R. adnata*, Bipinde, Cameroons; *R. parviflora*, Oban, southern Nigeria; *R. oblongifolia*, Senegambia, Sierra Leone, Gold Coast, Nigeria, Cameroons, Gabon, and Bahr el Ghazal; *R. Batesii*, Cameroons; *R. ovata*, Bipinde, Cameroons; and *R. sinuata*, Jaunde, Cameroons. The following new species from lower Guinea are included: *Rinorea varia*, Congo; *R. bracteolata*, Gabon River; and *R. glaucophylla*, Mfoa, Gabon. The following species are referred to *Rinorea: Alsodeia Johnstonii* Stapf, *A. prasina* Stapf, *A. crassifolia* Bak. f., *A. obanensis* Bak. f., and *A. Talbotii* Bak. f.—*T. J. Fitzpatrick.*

3097. Chipp, T. F. **Notes on Upper Guinea Flacourtiaceae.** Kew Bull. 1923: 265–266. 1923.—The author considers the genus *Dasylepis* to comprise the following 5 species: *D. racemosa* Oliver, *D. integra* Warb., *D. leptophylla* Gilg, *D. Blackii* (Oliver) Chipp, and *D. brevipedicellata* Chipp. *Dasylepis brevipedicellata* and *Scotellia Chevalieri* are proposed new species of the author and are delimited, the 1st from the Gold Coast and the 2nd from the Ivory Coast, both Tropical Africa. The following new combinations are given: *Dasylepis Blackii* (*Pyramidocarpus Blackii* Oliver), *Camptostylus ovalis* (*Oncoba ovalis* Oliver and *C. caudatus* Gilg), and *Caloncoba ficifolia* (*Oncoba ficifolia* Gilg). *Scotellia macropus* Gilg & Dink. is regarded as a synonym of *S. leonensis* Oliver. In the genus *Flacourtia*, material from Upper Guinea is referred to *F. flavescens* Wild., and the Nigerian material to *F. Vogelii* Hook. f. *F. Ramontchi* L'Herit. is a Madagascar plant.—*T. J. Fitzpatrick.*

3098. Fries, Rob. E. **Revision der tropisch-afrikanischen Carduus-Arten. [Revision of the tropical African species of Carduus.]** Acta Horti Bergiani 8: 11–38. *Pl. 1–4, fig. 1–2.* 1923.—Of this genus only 6 species and 2 varieties were known from tropical Africa until the author began his studies, based on museum material and on specimens collected by himself and his brother, Th. C. E. Fries, on Mt. Kenia, Mt. Aberdare and surroundings, in 1921–22. The genus is, in tropical Africa, montanic-alpine and does not occur in the hot lowlands, nor is it known from the West-African mountains. Most of the species, occurring on high levels, are endemic on their respective mountain tops. Twenty-two species are dealt with in this work, a key of the whole group being given. Some species have fimbriate bracts (as in certain Centaureae), others entire, some have high stems, others are acauline; these differences furnish the principal characters in dividing the genus. The following species, varieties and combinations are new: *Carduus Ellenbeckii*, *C. Theodori* α *typicus* β *serrulatus* and γ *serratus*, *C. nanus*, *C. platyphyllus*, *C. afromontanus* and var. *breviflorus*, *C. silvarum*, *C. Stolzii*, *C. kikuyorum* and var. *Goetzenii*, *C. nyassanus* (*C. leptacanthus* Fres. var. *nyassana* S. Moore) and var. *ruandensis*, *C. Steudneri* (*C. leptacanthus* Fres. var. *Steudneri* Engl.), *C. conjungens*, *C. subalpinus*, *C. kilimandscharicus*, *C. keniensis* α *typicus*, β *aberdaricus* and γ *elgonensis*, *C. centifolius*, and *C. millefolius*.—*O. Heilborn.*

3099. Guillaumin, A. **Matériaux pour la flore de la Nouvelle-Calédonie. [Materials for the flora of New Caledonia.]** Bull. Soc. Bot. France 69: 31–34. 1922.—The author gives a description of *Maba parviflora* Schltr. He gives a key to the fruits and a key to the leaves of the species in this genus.—*P. A. Young.*

3100. Guillaumin, A. **Matériaux pour la flore de la Nouvelle-Calédonie. [Materials for the flora of New Caledonia.]** Bull. Soc. Bot. France 69: 65–69. 1922.—This paper, No.

14 in the series, is a revision of the genus *Diospyros*. Two new species are described, namely, *D. Lecardii* and *D. Balansae*. One new name, *D. Sebertii*, is included. Keys to the species are given.—*P. A. Young.*

3101. Hughes, D. K. **The genus Panicum of the Flora Australiensis.** Kew Bull. 1923: 305–332. 1923.—The author divides the Paniceae into 14 genera, and gives extensive keys to the genera and to the species of *Digitaria*, *Brachiaria*, *Paspalidium*, *Panicum*, *Urochloa*, *Echinochloa*, and *Ichnanthus*. All the species are fully annotated including a list of imperfectly known species. The group considered is limited to *Panicum* as understood by Bentham. Two species, *Paspalum brevifolium* Fluegge and *Paspalum minutiflorum* Benth., not Steudel, have been moved to *Digitaria longiflora* Pers. and *Digitaria recta* Hughes, respectively. The following species are delimited and proposed as new: *Digataria robusta*, type from Melville Island, N. Territory; *D. recta*, Port Curtis, Queensland; *D. diminuata*, McIntyre River, N. S. Wales; *D. orbata*, Herbert's Creek, Queensland; *Paspalidium basicladum*, Kiminoppin, W. Australia; *Panicum delicatum*, near Port Darwin, N. Territory; *P. cymbiforme*, Cygnet Bay, W. Australia; *P. larcomianum*, Mt. Larcom, Queensland; *Ichnanthus oblongus*, Percy Island, Queensland; *I. Muelleri*, near King's Sound, W. Australia. The following new combinations are given: *Digitaria ctenantha*, *D. striata*, *D. parviflora*, *D. Baileyi*, *D. stenostachya*, *D. tenuissima*, *D. Brownei*, and its variety *monostachya*, *D. ammophila*, *D. coenicola*, *D. divaricatissima*, and *D. macractenia; Leptoloma papposa; Brachiaria holosericea*, *B. argentea*, *B. polyphylla*, *B. foliosa*, *B. piligera*, and its variety *intercedens; Paspalidium semitonsum*, *P. inacquale*, *P. retiglume*, *P. globoideum*, *P. jubiflorum*, *P. distans*, *P. gracile*, and its variety *rugosum*, and *P. rarum; Urochloa notochthona*, *U. Gilesii*, and *U. praetervisa; Echinochloa Crus-Galli*, variety *lacunarium; Ichnanthus australiensis*, *I. majusculus*, and *I. pauciflorus; Cyrtococcum oxyphyllum; Sacciolepis myosuroides; Entolasia stricta* and *E. marginata*. *Digitaria tonsa*, *Brachiaria ramosa* Stapf var. *grandiflora*, and *Panicum fulgidum* are given as new names and *Paspalidium gracile* var. *rugosum* is described as a new variety.—*T. J. Fitzpatrick.*

3102. Kudô, Yûshun. **Enumeratio Labiatarum specierum varietatum formarumque in Insulis Kurilensibus et Insula Yezoensi sponte nascentium. [Enumeration of the Labiatae occurring spontaneously in the Kurile Islands and on the Islands of Yezzo.]** Jour. Coll. Sci. Imp. Univ. Tôkyô 43: (Art. 8) 1–59. *2 pl.* 1921.—The treatise begins with a dichotomous key to the 21 genera included in the enumeration. Each genus containing more than 1 species is also provided with a determination-key to the species. There are 38 species recorded, of which *Teucrium teinense* and *Scutellaria yezoensis* are new. Many new varieties and forms are named.—*S. Ikeno.*

3103. Maekawa, Tokujiro. **On the wild chrysanthemum of North Japan.** Trans. Sapporo Nat. Hist. Soc. 8: 9–18. *1 pl.* 1921.—Formerly the wild chrysanthemums growing in the northeastern part of Japan, including Saghalien, Kurile Islands, Yezo and the north-eastern part of Honshiu (or the main island of Japan) were considered to contain only 3 distinct species, namely, *Chrysanthemum Gmelini* (Ledeb) Miyabe (distributed in Saghalien and in Yezo), *C. Weyrichii* Miyabe & Miyake distributed in Saghalien) and *C. arcticum* L. The last was known as having the widest distribution, because it extends from Kamtschatka and Behring Regions down to the north-eastern part of Honshiu, through Saghalien, Kurile Islands and Yezo. The writer noticed the fact that the chrysanthemums from different localities of Hokkaidô (Kurile Islands and Yezo) as well as from the north-eastern part of Honshiu, differ from one another in certain respects, and especially also that their seedlings are very variable and display at the same time conspicuous distinct characters peculiar to each type. In consequence of a study of dried specimens in the Herbarium of the Hokkaidô Imperial University, and observations made on living material in the Botanic Garden of the University as well as in native habitats, the writer distinguishes the following species: (1) *Chrysanthemum yezoense* n. sp. Syn., *Leucanthemum arcticum* Miq., Prol. Fl. Jap. p. 166 (non DC.), *Chrysanthemum arcticum* Fr. & Sav., Enum. Pl. Jap. Vol. 1, p. 234 (non L.); var. *typicum* n. var. Hab. Yezo, Honshiu, var. *stipulatum* n. var. Hab. Yezo, Honshiu, and var. *lobulifolium* n. var. Hab. Honshiu. (2) *Chrysanthemum arcticum* L. Syn. *Leucanthemum arcticum* DC. Hab. Kamtschatka, North-eastern Siberia, Behring Sea Islands, Saghalien, Kurile Islands and var. *yezoense* Maekawa n. var. Hab. Saghalien, Kurile Islands, Yezo. (3) *Chrysanthemum Gmelini*

(Ledeb.) Miyabe. Syn. *Leucanthemum Gmelini* Ledeb. Fl. Ros. Vol. II p. 541; Schmidt, Fl. Sach. p. 250. Hab Saghalien, Kurile Islands. (4) *Chrysanthemum littorale* Maekawa. n. sp. Hab. Yezo. (5) *Chrysanthemum Weyrichii* Miyabe & Miyake. Syn. *Leucanthemum Weyrichii* Maxim. Prim. Fl. Amur, p. Schm. Fl. Sach. 114. Hab. Saghalien.—The writer also discovered certain interesting facts existing between the forms and the geographical distribution which ranges from northern Kamtschatka to southern Japanese territories.—*Author.* (*Courtesy Japanese Jour. Bot.*)

3104. Nakai, Takenoshin. **Deutzia in Japonia, Corea et Formosa indigena. [Deutzia indigenous in Japan, Korea and Formosa.]** Bot. Mag. Tôkyô 35: 81–96. 1921.—The author classifies Japanese *Deutzia* into 2 sections and 3 subsections: among the latter, *Uniflorae*, comprising the Japanese species *Deutzia uniflora* Shirai, is new. Nineteen species are enumerated, of which *D. Hayatai*, *D. pulchra* var. *formosana*, *D. floribunda*, *D. kiusiana*, *D. microcarpa*, *D. naseana*, *D. gracilis* var. *latifolia*, *D. crenata* f. *oralis*, *D. crenata* f. *barbinervis*, *D. crenata* f. *macrocarpa*, and *D. prunifolia* var. *latifolia* are new species or varieties.—*Author.* (*Courtesy Japanese Jour. Bot.*)

3105. Nakai, Takenoshin. **Tentamen Systematis Caprifoliacearum Japonicarum. [Systematic treatment of the Caprifoliaceae of Japan.]** Jour. Coll. Sc. Imp. Univ. Tôkyô 42: Art. 2. *139 p.* 1921.—This paper is a monograph of Japanese Caprifoliaceous plants which comprises 91 species, 33 varieties and 21 forms. The following new tribes,, sections and subsections have been made: Chamaeceraseae—a tribe including the drupe-bearing genus *Lonicera;* Diervilleae—a tribe including the capsule-bearing genus *Diervilla*. Under the genus *Viburnum:* Sect. (1) *Gymnotinus*. Bud with no scales; lateral veins of leaves terminating at serrations; drupe black, putamen dorsiventrally compressed; subdivided into Subsect. (a) *Eugymnotinus*, without stolons; corolla rotate. Subsect. (b) *Urceolati*, with stolons; corolla urceolate. Sect. (2) *Solenolantana*. Bud without scales; leaves exstipulate; flowers salver-shaped; stamens inserted; drupe black; putamen dorsiventrally grooved. Sect. (3) *Sandankwa*. Bud with scales; leaves biennial; inflorescence paniculate, drooping, ending at the end of last year's branchlet; corolla salver-shaped; drupe red; putamen ventrally 1-grooved. Sect. (4) *Sieboldii*. Bud with scales; leaves annual without gland; lateral veins of leaves terminating at serrations; inflorescence paniculate, erect; corolla rotate; drupe red, then blackened; putamen ventrally sulcated. Sect. (5) *Tomentosi*. Bud with scales; leaves annual; the lateral leaves with veins ending at serrations; inflorescence umbellate-paniculate; corolla rotate; drupe red, then blackened; putamen ventrally sulcated. Under Sect. *Odontotinus* Rehder: Subsect. (a) *Japoaici*. Leaves biennial, exstipulate; seed compressed, sulcate on both sides. Subsect. (b) *Fusiformes*. Leaves biennial, exstipulate; seed fusiform. Subsect. (c) *Erosi*. Leaves annual, stipulate or exstipulate; seed compressed, sulcate on both sides. Subsect. (d) *Adenophylla*. Leaves annual; umbel sessile; seed ventrally sulcate. New species and varieties are as follows: *Sambucus Sielobdiana* Blume vars. *pubescens*, *glabrescens*, and *stenophylla*, *Viburnum liukiuense*, *V. boninsimense* Koidzumi, *V. fusiforme*, *V. Wrightii* Miq. var. *eglandulosum*, *V. brachyandrum*, *V. Tashiroi*, *V. koreanum*, *Abelia spathulata* Sieb. & Zucc. var. *tetrasepala* Koidzumi, *A. Tyaihyoni*, *Lonicera ibotaeformis*, *L. macrocalyx*, *L. tenuipes*, *L. monantha*, *L. subhispida*, *L. Harai* Makino var. *Tashiroi*, *L. strophiophora* Franchet var. *glabra*, *L. cerasoides*, *L. Watanabeana* Makino var. *viridissima*, *L. diamantiaca*, *L. sachalinensis* (Schmidt), *Diervilla decora*. Many corrections in the names of varieties and species are made.—*Author.* (*Courtesy Jap. Jour. Bot.*)

3106. W[right], C. H. **Indian species of Ericaulon.** [Rev. of: Fyson, P. F. **The Indian species of Ericaulon.** *88 p. Illus.* Methodist Publishing House: Madras, 1923 (see Bot. Absts. 11, Entry 4823; 12, Entry 6691).] Kew Bull. 1923: 303. 1923.—This very complete account originally appearing in the Jour. Med. Bot. is now issued in book form.—*T. J. Fitzpatrick.*

FLORISTICS AND PLANT DISTRIBUTION

3107. Anonymous. **The flora of Madras.** Kew Bull. 1923: 128. 1923.—Announcement is made of the publication of the 5th part of the Flora of the Presidency of Madras, by J. S. Gamble, including Ebenaceae in part to *Ilysanthes* of the Scrophulariaceae. Several new varieties and new combinations are included. [See Bot. Absts. 12, Entry 3622.]—*T. J. Fitzpatrick.*

3108. Benoist, R. **Contribution à l'étude de la flore des Guyanes. [Contribution to the flora of Guiana.]** Bull. Soc. Bot. France 69: 51–57, 104–110. 1922.—These articles consist of an annotated list of species of flowering plants, arranged by families. The collections were made in French Guiana.—*P. A. Young.*

3109. Bourquin, J. **Distribution du Fritillaria meleagris L. en Suisse. [Distribution of Fritillaria meleagris L. in Switzerland.]** Ann. Conservatoire et Jard. Bot. Genève 21: 69–71. 1919.—A history is given of this lily from its first mention by Gagnebin to the present time.—*A. S. Hitchcock.*

3110. Coste, H. **Le Pedicularis rosea Wulf. connu dès 1913 dans les Pyrénées ariégeoses. [Pedicularis rosea known in the Pyrenees since 1913.]** Bull. Soc. Bot. France 69: 178–179. 1922.

3111. Decrock, E. **Le Cardamine Plumieri Vill. dans les Alpes de Provence. [C. Plumieri in the Alps of Provence.]** Bull. Soc. Bot. France 69: 347. 1922.

3112. Fenoul, G. **Nouvelles localités de deux plantes rares, l'Arceuthobium Oxycedri Bieb. et le Viola pumila Chaix. [New localities for two rare plants: A. Oxycedri and V. pumlia].** Bull. Soc. Bot. France 69: 30. 1922.—The author collected *Arceuthobium Oxycedri* on *Juniperus communis* near Saint-Grégoire. *Viola pumila* was found in the marshes of Lesches.—*P. A. Young.*

3113. Gandoger, Michel. **L'ascension du mont Ida (île de Crète). [The ascent of Mount Ida on the Isle of Crete.]** Bull. Soc. Bot. France 69: 16–20. 1922.—The author lists the flowering plants seen on this trip.—*P. A. Young.*

3114. Gaume, R. **Contribution à l'étude de la flore de la Brie. [Contribution to the flora of Brie.]** Bull. Soc. Bot. France 69: 80–84, 608–611. 1922.—This is a list of previously described species with discussions of each.—*P. A. Young.*

3115. Guillaumin, A. **A propos d'une Tulipe monstrueuse. [On a tulip monstrosity].** Bull. Soc. Bot. France 69: 213. 1922.

3116. Lacaita, C. **Piante italiane critiche o rare. [Doubtful and rare Italian plants.]** Nuovo Gior. Bot. Ital. n.s. 28: 113–156. *Pl. 3–4.* 1921.—This is a critical taxonomic study, with synomyms, description and discussions of the following species: *Acanthus spinosus, A. spinulosus, A. spinosissimus, Betonica hirsuta, B. danica, B. incana, B. Monnieri, Biscutella incana, Ilex Aquifolium* var. *australis,* n. var., *Inula candida, I. limonifolia, I. verbascifolia, Iris collina, I. lorea, I. Sintenesii, Mentha microphylla, M. tomentosa, Onobrychis laconica, O. Tenoreana, O. Tommasinii, O. ocellata, Salvia ceratophylloides, Scabiosa crenata* var. *pseudisetensis n. var., S. Dallaportae, S. garganica, Sideritis syriaca, S. sicula, S. brutia, Spiraea hispanica, Typha angustata.—Ernst Artschwager.*

3117. Lacaita, C. **Piante italiane critiche o rare. (XCI–XCVII). [Doubtful and rare Italian plants.]** Nuovo Gior. Bot. Ital. N. S. 31: 19–35. *Pl. 1–3.* 1924.—The author discusses critically 7 species of *Onosma* as to their correct naming and distribution. He concludes that *Onosma cinereum* Schreb. (1767) should be removed from the European flora, but should replace the name *O. albo-roseum* Fisch. & Mey. (1831) for a plant of Asia Minor. *O. montanum* should be excluded from the flora of Italy and that of Greece and be rejected as "nomen confusum." *O. echioides L.* is the asterotrichus Italian species composed of 5 strains, description of which, together with their synonymy, is here given. *O. fastigiatum*Br.-Bl., is rare in Italy but more common in France. *O. helveticum* Boiss. is retained as a species and subdivided into 3 varieties. The new species, *O. lucanum,* is described. Differentiation points for *O. stellulatum* W.K. and the other asterotrichus species are given.—*P. D. Caldis.*

3118. Litardière, R. de. **Notes sur quelques Festuca des Alpes, des Cévennes et des Pyrénées. [Notes on species of Festuca in the Alps, Cevennes, and Pyrenees mountains.]** Bull. Soc. Bot. France 69: 179–183. 1922.—This is a list and discussion of several species and numerous subspecies and forms of *Festuca.—P. A. Young.*

3119. Pons, M. **Note sur quelques plantes nouvelles Briançonnais. [Some new plants from Briançon.]** Bull. Soc. Bot. France 69: 471–480. 1922.—Notes are recorded on several species of flowering plants, some of which are new to the region concerned.—*P. A. Young.*

3120. Rodriguez, L. **Contribution à l'étude de la flore du Guatémala.** [Contribution to the study of the flora of Guatemala.] Bull. Soc. Bot. France 69: 34–40, 373–378, 814–818. 1922.—This article consists of a discussion of a long list of previously published species of flowering plants, arranged by families.—*P. A. Young.*

3121. Roig, J. T. **Reseña sobre una excursion botanica a isla de pinos.** [Description of a botanical trip to the Isle of Pines.] Mem. Soc. Cubana Hist. Nat. "Felipe Poey" 5: 72–76. 1923.—A description of an excursion to the Isle of Pines, with a list of the plants collected is given.—*J. A. Faris.*

3122. Wilczek, E. **Note sur la présence en Suisse de l'Helianthemum nummularium subsp. glabrum.** [Note on the presence in Switzerland of Helianthemum nummularium subsp. glabrum.] Ann. Conservatoire et Jard. Bot. Genève 21: 453–455. 1922.—This is a discussion of the above named polymorphous species and its varieties.—*A. S. Hitchcock.*

MISCELLANEOUS, UNCLASSIFIED PUBLICATIONS

Sam F. Trelease, *Editor*

3123. Anonymous. **White oak acorns as food.** Missouri Bot. Gard. Bull. 12: 32–33. *Pl. 3.* 1924.

3124. Anonymous. [Rev. of: Compilation from Official Sources. **The year-book of the scientific and learned societies of Great Britain and Ireland: a record of the work done in science, literature and art during the session 1922–23 by numerous societies and government institutions.** 40th annual issue. *vii + 389 p.* C. Griffin & Co., Ltd.: London, 1923.] Nature 114: 119–120. 1924.

3125. Addey, F. **A note on the measurement of the vertical dimensions of objects by the use of the graduated fine adjustment.** Jour. Quekett Microsc. Club. 2nd Ser. 14^{88}: 279–288. *5 fig.* 1922.—"The true thickness of the object is the apparent thickness multiplied by the refractive index of the mounting medium, the cover-glass making no difference."—*L. B. Walker.*

3126. Atkins, W. R. G. **Some poetic allusions to phenomena of plant biology.** Nature 114: 158. 1924.

3127. Bradford, S. C. **A simple non-splash ring for use with Scheibler's desiccator.** Jour. Chem. Soc. [London] 125: 1546–1547. 1924.

3128. Brooks, F. T. **Imperial botanical conference.** Nature 114: 293–294. 1924.—This is a brief report of papers in various branches presented at the meeting at South Kensington, July 7–16.—*O. A. Stevens.*

3129. Brooks, Richard. **Device for maintaining a constant level in a water-bath.** Jour. Chem. Soc. [London] 125: 1546. *1 fig.* 1924.

3130. Colley, Reginald H. **A laboratory projection apparatus.** Phytopathology 14: 424–426. *Pl. 26–27.* 1924.—A description is given of an apparatus designed originally for photomicrography. The apparatus has proved very satisfactory for this purpose and also, with a few alterations, as a projection apparatus.—*B. B. Higgins.*

3131. Conn, H. J. **A report on basic fuchsin.** Science 60: 387–388. 1924.—The specifications given have been worked out with particular reference to the use of basic fuchsin in the Endo medium and for bacteriological staining. Dealers in biological supplies can now supply certified samples.—*C. J. Lyon.*

3132. Conn, H. J. **Certified safranin.** Science 59: 556–557. 1924.—The specifications which are to be required of safranin O in order to have it certified are listed. Other dyes must not be present; but since specification has not yet been completely attained by any company, the certified sample is to carry a label that declares its total dye content. The proper allowance for concentration can be easily made. Nearly all supply companies carry the certified stains, and they can be ordered without reference to a particular maker unless the purchaser has a preference.—*C. J. Lyon.*

3133. Fairchild, David. **Barro Colorado Island Laboratory.** Jour. Heredity 15: 99–112. *12 fig.* 1924.—An account is given of the Tropical Laboratory of the Association for Re-

search in Tropical America, in the Panama Canal Zone. The facilities of this laboratory are now open to accredited research men in any of the biological sciences. Inquiries should be addressed to the National Research Council, Washington, D. C.—*Robert Cook.*

3134. Hall, Ansel F. **High Sierra camps.** Sierra Club Bull. **1924:** 37–42.—This describes camp service enabling hikers to study the fauna and flora of Sierras.—*Leonas L. Burlingame.*

3135. Lodewick, J. Elton. **A shorter celloidin method.** Science **60:** 67–68. 1924.—The proposed method uses a pressure tank and but 2 solutions of celloidin. A pressure of about 100 pounds is used for ½-hour periods for each solution. Better penetration is secured than had been obtained with the older method.—*C. J. Lyon.*

3136. McEwen, George F. **Forecasting seasonal rainfall from ocean temperatures.** California Citrograph **10:** 39. 1924.—A brief statement is given of the theory underlying the forecasting of seasonal rainfall in southern California from the ocean temperatures along the coast, with a table showing data for the past 8 seasons and the indication for the coming winter. A change of 1°F. (in ocean temperature) has been found to correspond, on the average, to a change of 2 inches of rainfall over the coastal region of Southern California. The ocean temperature during the past season has been the lowest recorded during the last 8 years and indicates an increase of about 5 inches above the 8-year average rainfall.—*C. S. Pomeroy.*

3137. Moore, George T. **Thirty-fifth annual report of the director.** Missouri Bot. Gard. Bull. **12:** 1–22. 1924.—A new garden, removed from the unfavorable conditions of the present garden, is projected.—*O. T. Wilson.*

3138. Pack, Dean A. **Photographic method for measuring and recording morphological and physical characters of plants.** Phytopathology **14:** 433–435. *Fig. 1–3.* 1924.—The method consists of the arrangement of cross section paper, as a background, and of mirrors in such a way as to give, in a single photograph, 4 views of a plant.—*B. B. Higgins.*

3139. Spalding, Perley. **The Tropical Plant Research Foundation.** Phytopathology **14:** 430–432. 1924.—An outline is given of the organization, incorporation, and purpose of the Tropical Research Foundation. W. A. Orton, formerly of the U. S. A. Dept. Agric., is director and general manager. Correspondence may be sent in care of the National Research Council. —*B. B. Higgins.*